

# THE ATHENÆUM

Journal of English and Foreign Literature, Science, and the Fine Arts.

No. 1977.

LONDON, SATURDAY, SEPTEMBER 16, 1865.

PRICE  
THREEPENCE  
Stamped Edition, 4d.

**UNIVERSITY COLLEGE, LONDON.**—PROSPECTUSES of the Faculty of Medicine, Faculty of Arts and Laws, and Junior School for the ensuing Session, will be forwarded on application to the Office of the College.

CHAS. C. ATKINSON, Secretary to the Council.

August 16, 1865.

**UNIVERSITY COLLEGE, LONDON.**—THE SESSION of the FACULTY of MEDICINE will OPEN on MONDAY, October 2.

INTRODUCTORY LECTURE, at 3 P.M., by JOHN MARSHAL, F.R.S., Surgeon to the Hospital and Instructor in Practical Surgery in the College. Subject—The Art of Healing, its Scope, Limits, and Relations with Science.

LECTURES FOR WINTER TERM:—Anatomy, Professor Ellis—Anatomy and Physiology, Professor Shattock, M.D., F.R.S.—Chemistry, Professor Willis, M.D., F.R.S.; Comparative Anatomy, Professor Grant, M.D., F.R.S.—Medicine, Professor Jenner, M.D., F.R.S.—Practical Physiology and Histology, Professor Harley, M.D., F.R.S.—Surgery, Professor Erichsen—Dental Surgery, Mr. Tibetson, F.R.C.S.E.—Medical Clinical Lectures by Dr. Jenner, F.R.C.S.E.—Gynaecology, also by Dr. Jenner—Lectures by Professor of Clinical Medicine, whose special duty is to train the Pupils in the practical study of disease. Surgical Clinical Lectures especially by Mr. Quain and by Mr. Erichsen. Lectures on Ophthalmic Cases by Mr. Wharton Jones.

SCHOLARSHIPS, EXHIBITIONS, AND PRIZES.

Three Entrances Exhibitions of the respective value of 30*s.*, 30*d.*, and 10*p.* per annum, tenable for two years.

Atkinson Morley Scholarship for the promotion of the study of Medicine, tenable for three years.

London Exhibitions for general proficiency in Medicine and Surgery, 30*s.*, October, 1865, and October, 1866.

Fitter Exhibition for general proficiency in Pathological Anatomy, 30*s.*

Dr. Newell's and Liston's Medals for Clinical Medicine and Clinical Surgery.

Prospects and the Regulations for Scholarships, Exhibitions, and other Prizes, may be obtained at the Office of the College.

GEORGE HARLEY, M.D., F.R.S., Dean of the Faculty.

CHAS. C. ATKINSON, Secretary to the Council.

August 16, 1865.

The Lecture to the Classes of the Faculty of Arts will commence on Monday, the 9th of October.

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**KING'S COLLEGE, LONDON.**—The SCHOOL will RE-OPEN on TUESDAY, Sept. 18. Pupils can be admitted to—

1. The Division of Classics, Mathematics, and General Literature, the students in which are called Preparative Pupils for the University, for the Theological, General Literature, and Medical Departments of King's College, and for the Learned Professions.

2. The Division of Modern Instruction, including Pupils intended for Mercantile Pursuits, for the Classes of Architecture and Engineering in King's College, for the Military Academy, for the Civil Service, for the Royal Navy, and for the Commercial Marine.

Two Scholarships, of £10. per annum, for three years, will be given to one Prospective or to the son of a Preparative Pupil, who entered the School in May, 1865, or who shall enter it in September next. The Examination will begin on Thursday, September 11. For subjects, see the Calendar for 1865-6.

For information, apply personally, or by letter marked outside "Prospectus," to J. W. CUNNINGHAM, Esq., Secretary.

**MINERALOGY.—KING'S COLLEGE, LONDON.**—Professor TENNANT, F.G.S., will deliver a Course of LECTURES on MINERALOGY, with a view to facilitate the Study of Geology and the Application of Mineral Substances in the Arts. The Lectures will commence on Friday, October 1, at 9 a.m., and will continue every day, excepting Wednesday and Friday, at the same hour, until Christmas. Fee, £1. Another Course of Lectures on Mineralogy and Geology will be given on Wednesday Evenings from 8 to 9. These begin on October 11, and will be continued until Easter, 1866. Fee, £1. Mr. JELF, D.D., Principal.

**ROYAL SCHOOL OF MINES.**—Director, Sir RODERICK IMPEY MURCHISON, K.C.B., F.R.S. &c.

During the Session 1865-6, which will commence on the 2nd of OCTOBER, the following Courses of LECTURES and PRACTICAL DEMONSTRATIONS will be given:—

1. Chemistry—By E. Frankland, F.R.S. &c.

2. Metallurgy—By John Percy, M.D., F.R.S.

3. Mineral History—By H. Huxley, F.R.S.

4. Mineralogy—By Washington Smyth, M.A., F.R.S.

5. Mining—By F. R. S.

6. Geology—By A. C. Ramsay, F.R.S.

7. Applied Mechanics—By Robert Willis, M.A., F.R.S.

8. Physics—By John Tyndall, F.R.S.

Instruction in Mechanical Drawing, by the Rev. J. Haythorne Edgar, M.A.

The Fee for Students desirous of becoming Associates, is £10, in one sum, on entrance, or two annual payments of £5, exclusive of the Laboratories.

Pupils are received in the Royal College of Chemistry (the Laboratory of the School), under the direction of Dr. Frankland, and in the Metallurgical Laboratory under the direction of Dr. Percy.

Tickets to separate Courses of Lectures are issued at £1. and 4d. each.

Officers in the Queen's Service, Her Majesty's Consuls, acting Mining Agents and Managers, may obtain tickets at reduced prices.

Certified Schoolmasters, Pupil-Teachers, and others engaged in Education, are admitted to the Services at reduced fees.

His Royal Highness the Prince of Wales has granted two Scholarships, and several others have also been established.

For a Prospectus and information apply at the Museum of Practical Geology, Jermyn-street, London, S.W.

TRENTHAM REEKS, Registrar.

**QUEEN'S COLLEGE, CORK.**—SESSION, 1865-6.

**MATRICULATION and SCHOLARSHIP EXAMINATIONS.**

On TUESDAY, the 17th of October next, at Ten o'clock A.M., an EXAMINATION will be held for the MATRICULATION of STUDENTS in the Faculties of Medicine, Law, and Law, and in the Departments of Civil Engineering and Agriculture.

The Examinations for Scholarships will commence on Thursday, the 19th of October. The Council have the power of conferring at these Examinations Eight Senior Scholarships of the value of 40s. each; Six Scholarships in the Arts, of the value of 20s. each; Five of Law; and Forty-2 Junior Scholarships, viz. Fifteen in Literature, and Fifteen in Science, of the value of 5s. each; Eight in Medicine, value 2s. each; Three in Law, and Five in Civil Engineering, of the value of 2s. each; to Fifteen of which First Years Students will be admitted.

Prospects, containing full information as to the subjects of the Examinations, &c., may be had on application to the Registrar.

By order of the President,  
ROBERT J. KENNY, Registrar.

**UNIVERSITY HALL, GORDON-SQUARE.**

**Principal**—E. S. BEESLY, M.A. Oxon, Professor of History in University College, London, and late Assistant-Master of Marlborough College.

**Vice-Principal**—GEO. C. DE MORGAN, M.A. Lond.

Students at University College are received into the Hall, and reside under College Government. There are twenty-nine sets of rooms, some of which are now vacant, at rents varying from 10s. to 50s. the Session. The Hall will open for the Session in October next, at the same time as University College.

SCHOLARSHIPS.—A Meeting of the Trustees of the "Ghilchrist Foundation" is expected to be held in September, 1865; and there is reason to hope that the Trustees will grant to Resident Students, who have obtained the College Diploma, Scholarships for three years of regular attendance at the College Classes. The Scholarships will probably be available for competition during the coming Session. Modern Languages will have much weight in the Examination.

For particulars, apply to the Honorary Secretary or to the Principal.

M. BERKELEY HILL, Hon. Sec.

September, 1865.

**THE ANNUAL COURSE of SINGING.**

CLASS for Professors, and other Ladies and Gentlemen who can read Music, will be resumed on 16th September, at the KINDERGARTEN and SCHOOL, 32, Tavistock-place, Tavistock-square, W.C., to learn the INTERNATIONAL SYSTEM, (including Harmony), in Three Terms of Three Months' each, on Saturday evenings, from 4 to 5 1/2 p.m. Fee, 5s. per term, which will be returned in Music.

"There is good sense in the little threepenny book."

News of the World.

N.B.—No admittance during the Annual Course after September.

J. F. BORSCHITZKY, 32, Tavistock-place, London, W.C.

Explanatory Pamphlet on 'Musical Education.'

2d post.

"Mr. Borschitzky's very ingenious theories."—Art-Journal.

"His views and plan are sagacious and clear."—John Bell.

"His work abounds in aphorisms, some of them strikingly original."—Era.

"There is good sense in the little threepenny book."

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**ST. GEORGE'S HOSPITAL MEDICAL SCHOOL—WINTER SESSION.**

The INTRODUCTORY LECTURE will be given by GEORGE D. POLLOCK, Esq., on MONDAY, the 2nd October, at 2 p.m. Perpetual Pupil's Fee, 100.; Compounder's, 90.; Dental Pupil's, 45.

**ST. MARY'S HOSPITAL MEDICAL SCHOOL.**

The WINTER SESSION 1865-6 will COMMENCE on MONDAY, OCTOBER 2, at 8 o'clock P.M., with an Introductory Address by Dr. HANDFIELD JONES, F.R.S.

At the Hospital, the Medical Appointments, including five House-Surgeons, the amount of which exceeds any Scholarship of 50s. each, and a Resident Registration fee of 10s. a year, are open to the Pupils without additional Fee. To enter obtain Prospectus, and for other information, apply to any of the Medical Officers and Lecturers, or to

ERNEST HART, Dean of the School.

Additional Lecture, on which the attendance is optional and without Fees, viz. on the Hebrew of the Old Testament; on the Greek of the New Testament; on the Relations of Religion to the Life of the Scholar.

Classes, for Persons not attending the Day Classes, include the following subjects of instruction, viz. Chemistry, Mathematics, Mental and Moral Philosophy, Logic, English Language and Literature, English History, Political Economy, Natural Philosophy, Chemistry, Natural History, French and German.

Drawing—Mr. W. Walker.

Conversations—Mr. W. J. Jerons, M.A.

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Conversations—Mr. W. J. Jerons, M.A.

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## UNIVERSITY OF ABERDEEN.

Session 1865-66.

Chancellor—DUKE OF RICHMOND.

Vice-Chancellor and Principal—P. C. CAMPBELL, D.D.

Lord Rector—EARL RUSSELL, K.G. LL.D.

## I.—FACULTY OF ARTS.

The SESSION Commences on MONDAY, the 30th October, and Closes on FRIDAY, 6th April.

The LECTURES begin on TUESDAY, 7th November.

CLASSES.	PROFESSORS.	HOURS.	CLASS FEES.
JUNIOR GREEK .....	WILLIAM D. GEDDES, M.A., and Assistant	9 to 10 A.M., and 11 A.M. to 12½ P.M.	£3 3 0
SENIOR GREEK .....	WILLIAM D. GEDDES, M.A., and Assistant	10 to 11 A.M.	2 2 0
JUNIOR LATIN .....	ROBERT MACLAURIE, LL.D., and Assistant	10 to 11 A.M., and 12½ P.M. to 1 P.M.	3 3 0
SENIOR LATIN .....	ROBERT MACLAURIE, LL.D., and Assistant	11 A.M. to 12½ P.M.	2 2 0
ENGLISH LANGUAGE AND COMPOSITION .....	ALEXANDER BAIN, M.A.	11 to 12½ P.M. Monday, Wednesday, and Friday	1 1 0
LOGIC .....	ALEXANDER BAIN, M.A.	11 A.M. to 12½ P.M. Tuesday and Thursday; 12½ to 1½ P.M. daily	3 3 0
JUNIOR MATHEMATICS .....	FREDERICK FULLER, M.A., and Assistant	9 to 10 A.M., and 12½ P.M. to 1½ P.M.	3 3 0
SENIOR MATHEMATICS .....	FREDERICK FULLER, M.A., and Assistant	10 to 11 A.M.	2 2 0
MORAL PHILOSOPHY .....	WILLIAM MARTIN, M.A.	9 to 10 A.M. daily; 11 to 12½ A.M. on Monday, Wednesday, and Friday	3 3 0
JUNIOR NATURAL PHILOSOPHY .....	DAVID THOMSON, M.A., and Assistant	9 to 10 A.M. daily; 11½ A.M. to 1½ P.M. Monday, Wednesday, and Friday	3 3 0
SUPERIOR NATURAL PHILOSOPHY .....	DAVID THOMSON, M.A., and Assistant	10 to 11 A.M.	3 1 0
NATURAL HISTORY .....	JAMES NICOL, F.R.S.E.	2 to 3 P.M.	3 3 0

The Fee for Students taking a Senior Class in any subject, without previous attendance on the Junior Class in the same subject, is £1. See for the Fee for the Degree of M.A., &c.

The Course of Study for the Degree of M.A. embraces two years' attendance on Greek, Latin, and Mathematics, and one on English Literature, Natural Philosophy, Logic, Moral Philosophy, and Natural History. All Students will at the time of their entrance to the University, shall, on examination be found qualified to attend the Higher Classes of Latin, Greek, and Mathematics or any of them, shall be admitted to such Higher Class or Classes, without having attended the first or Junior Class or Classes.

## BURSARIES.

The Annual Bursary Competition will begin on Monday, 20th October, at 9 A.M., an weekly interval will be observed. Thirtynine Bursaries, of which twenty-eight are in the Patronage of the University, and eleven in that of the Magistrates and Town Council of Aberdeen. All but nine are open without restriction. They are payable during the four years of the Curriculum, and are of the following amounts:—One of £100.; One of £60.; Three of £30.; One of £20.; Eight of £12.; One of £10.; Three of £4.; Three of £3.; Two of £2.; Eight of £1.; Two of 7½.; and Two of 6½. Candidates are requested to bring with them Certificates of their Age, signed by the Ministers and Session-Clerks of their respective Parishes, if required, if when the result of the Examinations is informed.

Candidates for the Masperhorn Bursary are requested to lodge with the Secretary, on or before the 30th October. Certificates from a Gaelic Minister as to their knowledge of the Gaelic Language.

Of the Bursaries under private Patronage, seventeen were vacant at the close of last Session, viz.:—One of £25.; One of £24.; Five of £14.; One of £12.; Two of £10.; Five of £8.; One of £6.; and Five of inferior value.

## II.—FACULTY OF MEDICINE.

WINTER SESSION, commencing on the First Tuesday of November.

CLASSES.	PROFESSORS.	HOURS.	CLASS FEES.
ANATOMY .....	Professor STRUTHERS, M.D.	11 A.M. ....	£3 3 0
ANATOMICAL DEMONSTRATIONS .....	Professor STRUTHERS, M.D.	2 P.M. ....	2 2 0
PRACTICAL ANATOMY .....	Professor STRUTHERS and the Demonstrator.	9 to 4	3 3 0
CHEMISTRY .....	Professor BRAZIER	3 P.M. ....	3 3 0
INSTITUTES OF MEDICINE .....	Professor OGLIVIE, M.D.	4 P.M. ....	3 3 0
BURGESS, J. .....	Professor PIRIE, C.M., F.R.S.E.	10 A.M. ....	3 3 0
PRACTICE OF MEDICINE .....	Professor MACROBIN, M.D.	3 P.M. ....	3 3 0
MIDWIFERY AND DISEASES OF WOMEN AND CHILDREN .....	Professor DYCE, M.D.	4 P.M. ....	3 3 0
ZOOLOGY, WITH COMPARATIVE ANATOMY .....	Professor NICOL, F.R.S.E. F.G.S.	2 P.M. ....	3 3 0
MEDICAL LOGIC AND MEDICAL JURISPRUDENCE .....	Professor OGSTON, M.D.	9 A.M. ....	3 3 0

SUMMER SESSION, commencing on the First Monday of May.

Royal Infirmary—Daily. Perpetual Fee to Hospital Practice,

or, first year, £1. 10s.; second year, 3s. Clinical Medicine and

Clinical Surgery—each 3s. 3d.

Anatomical Demonstrations—Professor Struthers and the Demonstrator, 9 to 4.

Practical Chemistry—Professor Brazier. 1 P.M. 31. 3s.

Medical Jurisprudence (including all Dues) for the Winter and Summer Sessions, M. 31. 3s. for the Summer Session alone, 10s.

Instruction in Histology and the Use of the Microscope is given during the Summer Session.

## III.—FACULTY OF DIVINITY.

The SESSION will commence on MONDAY, 11th December, and close on FRIDAY, 30th March.

CLASSES.	PROFESSORS.	HOURS.	CLASS FEES.
SYSTEMATIC THEOLOGY .....	ROBERT MACPHERSON, D.D.	9½ A.M. ....	£1 11 6
ORIENTAL LANGUAGES .....	ANDREW SCOTT, M.A. ....	1 P.M. ....	1 11 6
CHURCH HISTORY .....	WM. R. PINE, D.D. ....	1 P.M. ....	1 11 6
BIBLICAL CRITICISM .....	WILLIAM MILLIGAN, D.D.	12 NOON. ....	1 11 6
MATRICULATION FEE .....		11 A.M. ....	1 11 6

## BURSARIES.

There will be open for Competition, on SATURDAY, the 16th December, at 10 A.M., TWO BRUCE BURSARIES, of the value of £1. each, tenable for three Years, and open to Masters of Arts of any University of Scotland entering on their First or Second Session of the Study of Divinity.

The Subjects of Competition are—the Greek Gospel of St. Luke, and Butler's Analogy, Part II.

## IV.—FACULTY OF LAW.

WINTER SESSION.—The SESSION will commence on MONDAY, the 6th November, and close at the End of March.

CLASSES.	PROFESSORS.	HOUR.	FEES.
COTS LAW .....	{ PATRICK DAVIDSON, LL.D. GEORGE GRUB, LL.D., Substitute. } ...	3 P.M. daily.	£2 2 0

MATRICULATION FEE, for Winter and Summer Session ..... £1 0 0

SUMMER SESSION.—LECTURES will be given on CONVEYANCING, of which due intimation will be given September 1, 1865.

N.B.—Further particulars are to be found in the 'University Calendar,' published by WYLIE & SON, Aberdeen. Price 1s. 6d., or 1s. 7d. by post.

## UNIVERSITY OF EDINBURGH.

Chancellor—LORD BROUGHAM.

Vice-Chancellor—Principal Sir DAVID BREWSTER, K.H.

Rector—The Right Hon. W. E. GLADSTONE.

The SESSION will commence on WEDNESDAY, Nov. 1, 1865.

The CLASSES for the different Branches of STUDY will be Opened as follows:

## I. LITERATURE AND PHILOSOPHY.

Classes.	Days and Hours of Attendance.	Professors.
Junior Humanity .....	Wed. Nov. 1.-12 & 2	Prof. Sellar.
Senior Humanity .....	Wed. Nov. 1.-10	Prof. Sellar.
First Greek .....	Wed. Nov. 1.-9 & 1	Prof. Blackie.
Second Greek .....	Wed. Nov. 1.-11	Prof. Blackie.
First Mathematical .....	Wed. Nov. 1.-12	Prof. Kelland.
Second Mathematical .....	Wed. Nov. 1.-10	Prof. Kelland.
Mathematical .....	Wed. Nov. 1.-9	Prof. Fraser.
Logic and Metaphysics .....	Wed. Nov. 1.-9	Prof. Macdougall.
Moral Philosophy .....	Frid. Nov. 3.-3	Prof. Macdougall.
Political Economy .....	Frid. Nov. 3.-3	Prof. Macdougall.
Natural Philosophy .....	Wed. Nov. 1.-11	Prof. Macdougall.
Rhetoric and English Literature .....	Wed. Nov. 1.-4	Prof. Smyth.
Practical Astronomy .....	Frid. Dec. 1.-12	Prof. Smyth.
Agriculture .....	Frid. Nov. 10.-4	Prof. Wilson.
Sanskrit .....	Wed. Nov. 1.-11 & 12	Prof. Aufrecht.
Music .....	Frid. Dec. 1.-1	Prof. Aufrecht.

## II. THEOLOGY.

Divinity—Junior Class	Thurs. Nov. 9.-10	Rev. Prof. Crawford.
Senior Class	Thurs. Nov. 9.-11	Rev. Prof. Stevenson.
History .....	Thurs. Nov. 9.-12	Rev. Prof. Stevenson.
Biblical Criticism and Biblical Antiquities .....	Thurs. Nov. 9.-1	Rev. Prof. Lee, D.D.
Hebrew—Judaic Class .....	Thurs. Nov. 9.-9	Rev. Prof. Lee, D.D.
Advanced Class—Hebrew & Arabic .....	Thurs. Nov. 9.-10	Rev. Prof. Liston.
Hindustani .....	Thurs. Nov. 9.-11	Rev. Prof. Liston.

## III. LAW.

Civil Law .....	Wed. Nov. 1....	9 Prof. Muirhead.
Laws of Scotland .....	Wed. Nov. 1....	10 Prof. MacLagan.
Marriage and Jurisprudence .....	Wed. Nov. 1....	2 Prof. MacLagan.
Conveyancing .....	Wed. Nov. 1....	4 Prof. Lorimer.
Constitutional Law and Constitutional History .....	Wed. Nov. 1....	4 Prof. Bell.

\* The Course will terminate before the Christmas Vacation.

## IV. MEDICINE.

Dietetics, Materia Medica, and Pharmacy .....	Wed. Nov. 1....	9 Prof. Christison.
Chemistry .....	Wed. Nov. 1....	10 Prof. Playfair.
Surgery .....	Wed. Nov. 1....	10 Prof. Spence.
Institutes of Medicine .....	Wed. Nov. 1....	11 Prof. Bennett.
Midwifery and Diseases of Women & Children .....	Wed. Nov. 1....	11 Prof. Syme.
Clinical Surgery (Morning & Afternoon) .....	Thurs. Nov. 2....	12 Prof. Syme.
Clinical Medicine (Morning & Afternoon) .....	Frid. Nov. 3.-12 to 2	{ Laycock, and MacLagan.

Anatomy .....	Wed. Nov. 1....	1 Prof. Goodair.
Natural History .....	Wed. Nov. 1....	2 Prof. Laycock.
Practice of Physic .....	Wed. Nov. 1....	3 Prof. Laycock.
General Pathology .....	Wed. Nov. 1....	4 Prof. Henderson.
Anatomical Demonstrations .....	Wed. Nov. 1....	4 Prof. Goodair.

## ROYAL INFIRMARY, at Noon, Daily.

Practical Anatomy, under the Superintendence of Prof. Goodair. Practical Chemistry, under the Superintendence of Professor Lyon Playfair. Analytical Chemistry, under the Superintendence of Professor Lyon Playfair. Practical Physiology, under the Superintendence of Prof. Goodair.

Natural History, by Prof. Allman. Medical Psychology, by Prof. Allman.

Medical Jurisprudence, by Prof. Allman.

MATRICULATION.—Every Student, before entering with any Professor, must produce a Matriculation Ticket for the ensuing Session. Tickets will be issued at the Matriculation Office in the College, every lawful day, from Ten o'clock a.m. till Four o'clock p.m., except on Saturdays, when it will be shut at One o'clock precisely.

Every Student applying for Books must present to the Librarian his Matriculation Ticket for the Session, with the Ticket of attendance of one Professor.

Every Book taken out must be returned within a Fortnight uninjured.

N.B.—Information relative to the Curricula of Study for Degrees, Examinations, &c., will be found in the University Calendar, and may be obtained on application to the Secretary, at the Library.

A Table of Fees may be seen in the Matriculation Office, and in the Reading-room of the Library.

By authority of the Senatus, September, 1865. ALEX. SMITH, Sec. to the University.

**THE ATHENÆUM** for GERMANY and EASTERN EUROPE.—Mr. LUDWIG DENICKE, of Leipzig, begs to inform the public that he has made arrangements for a weekly issue of THE ATHENÆUM JOURNAL. The subscription will be 14 thaler for three months; 2 thalers for six months; and 6 for twelve. Issued at Leipzig on Thursday.

Orders to be sent direct to LUDWIG DENICKE, Leipzig, Germany.  
\*\* German Advertisements for the ATHENÆUM Journal also received by LUDWIG DENICKE, as above.

**A YOUNG SURVEYOR**, in good practice, and with a good social connexion, and having the desirability largely extend his business to a wider district, desirous of meeting with a Nobleman or Gentleman who would support him with capital, as a sleeping partner. A very considerable share of the profits would be given in return.—Address, in confidence, to A. Z. ADAMS & FRANCIS, 59 Fleet-street, E.C.

**A LAWYER** and his Family, in STUTTGART, (capital of Württemberg), would willingly accommodate TWO or THREE YOUNG LADIES, who would be received as members of the Family, and treated as such.—References can be made to Mrs. Browne, 14, Sackville-street, London-derry, Ireland; or to General von Kappelin, His Majesty's Adjutant, Stuttgart.

**EDUCATIONAL**.—Mr. WILLIAM WATSON, B.A., formerly of 60, Oakley-square, and of University College, London, receives PUPILS at his present Residence, Oakley House, Wellington-place, Reading. The Term will commence on the 20th of September. Prospectuses, Testimonials, &c., will be forwarded on application.

**EDUCATION**.—A MORNING CLASS for YOUNG GENTLEMEN to the Age of Ten, is held by Ladies of great experience in Teaching. Most unexceptionable references given.—Address A. M., 33, Fitzroy-square, W.

**HYDE PARK COLLEGE** for LADIES, 115, GLOUCESTER-TERRACE, Hyde Park.

The Senior Term begins September 18th.

Prospectuses, containing Terms and Names of Professors, may be had on application.

**GOVERNESS**.—A Young Lady having left a situation which she occupied three years, desires a RE-ENGAGEMENT WITH A FAMILY. Applications, through Miss French, good Music and Singing. Address, M. G. Miss Stracey's Library, 2, Hanover-place, Clarence-gate, Regent's Park.

**THE GOVERNESS'S INSTITUTION**, 34, SOHO-SQUARE.—MRS. WAGHORN, who has resided many years abroad, specially invites the attention of the Nobility, Gentry, and Principals of Schools, to her REGISTER of TEACHERS, and the GOVERNESSES, TEACHERS, COMPANIONS, TUTORS and PROFESSORS, School Property transferred, and Pupils introduced in England, France and Germany. No charge to Principals.

**A MARRIED PHYSICIAN** of great Experience, residing in one of the Home Counties, twenty miles from London, wishes to receive into his house a LADY, mentally or nervously affected. His house is a pleasant situate in its own grounds of three acres, on the outskirts of a village, one mile and a half from a Railway Station. For terms, &c. apply by letter to BETTY, Messrs. Kingsbury & Co., Birchin-lane, Cornhill, London, E.C.

**DEAF and DUMB.—PRIVATE EDUCATION**.—The Writer of the Pamphlet on the 'Education of the Deaf and Dumb,' advertised in the *Athenæum*, and which appeared in the 'List of New Books' for Saturday, August 13th, 1865, desires to receive a FEW MORE YOUNG LADIES thus afflicted, as resident Pupils, to be educated according to the views therein expressed.—Address M. E. H., Rist's Library, Kensington.

**HIGH SCHOOL** of EDINBURGH, SESSION 1865-66.

#### CLASSICS AND ENGLISH.

Rector,

LEONARD SCHMITZ, PH.D., LL.D., F.R.S.E., 8, Royal Terrace.

Masters,

John Macmillan, M.A. Edin., F.S.A. Scot., 16, Buccleuch-place. John Carmichael, M.A. Edin., F.S.A. Scot., 16, London-street. Arch. H. Bryce, LL.D. Trin. Coll. Dub., 13, Salisbury-road. James Donaldson, M.A., 8, Mayfield-street.

French—M. Charles Henry Schneider. German—Dr. Meynwald, 33, Dundas-street. Arithmetic and Mathematics—William Moffat, M.A., 12, Mansion-house-road, Grange. Writing and Book-keeping—Mr. William Cooper, 17, York-place. Drawing—Walter Ferguson, F.S.A. Scot., 70, Gilmore-place. Fencing and Gymnastics—Captain Roland, 30, Gaylord-square.

**THE HIGH SCHOOL** will RE-ASSEMBLE on MONDAY, the 2nd October, when the FIRST or ELEMENTARY CLASS will be formed by Mr. DONALDSON. The only requisite qualification for this Class is that the pupil be able to read English with ease.

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LONDON, SATURDAY, SEPTEMBER 16, 1865.

## LITERATURE

*Memoirs of the Life of William Shakespeare, with an Essay toward the Expression of his Genius, and an Account of the Rise and Progress of the English Drama.* By Richard Grant White. (Boston, Little & Co.; London, Low & Co.)

The life of Shakespeare is still the puzzle, the disgrace, and the despair of critical art. Although it is beyond question the greatest of all literary subjects, nothing has been made of it better than an antiquary's jest. Genius, prudence, labour, hospitality, success—noble virtues, noble services—are stamped upon that story, like figures on a coin. But the story itself appears to lack the ordinary marks of actual truth. It is a history without details. The tale may be quite true, and the moral beauty of it may represent material facts, but we have no evidence to convince the eye and ear. That large life of the Poet,

Spirits are not finely touched  
But to fine issues—

clings to the actual world of dates by such slender threads that we can barely seize it as a part of the wide province of prosaic fact. Shakespeare is the highest name in the highest of all arts; higher than that of Homer, that of Dante; and of the selectest and supremest band of poets, he is also the youngest born. Yet we have nearly everything still to learn about him. It is true he lived in a great city, in the neighbourhood of a busy Court, in the midst of taverns and theatres, and among a nation of newsmongers and letter-writers; but when we come to these idlers and gossips, who loved to tell each other of "some new thing," and bid them speak what they know of this player, their faces are all but blank. They have nothing to say. Player? One William Shakespeare? Yes; no more, no less; the author of 'Hamlet,' 'Othello,' and 'Measure for Measure.' Certainly; he was a man who wrote plays; those and some others; also poems and sonnets. But beyond these general words the oracles are dumb. Dates, names, incidents, stories, conversations, everything entering into the realities of a man's life, must be sought elsewhere by those who want them; sought, it may be feared, for ever, evermore in vain.

Are we sure of a single fact in what is called Shakespeare's life? Sir William Penn was said to be a suppressed character in English history. Is William Shakespeare another? A modern critic of the destructive school would reject as fable the whole bases of the poet's life. If the subject came in their way, Strauss and Renan, perhaps Milman and Colenso, would feel no compunction in stigmatizing Shakespeare as "unhistorical." And critics of a safer school of thought would see that in doing so they would be acting in good faith according to their principles and the measure of their light. Clouds and mists surround the poet as a man so closely that of all the theories of his life, the least unintelligible theory would perhaps be one assuming that he never lived at all.

Of course there would be difficulties in the way of a theory making Shakespeare an illusion of the mind—a convenient invention—a masculine form of Betsy Prigg's invisible friend. Every theory has its weak points. It certainly might be urged in favour of Shakespeare having lived and written books, that the books remain, a thin quarto of sonnets, other thin quartos of poems, 'Lucrece' and 'Venus and Adonis,' a thick folio of plays; that sundry portraits of the man exist in National Portrait Galleries

and elsewhere; that the house in which he was born is known. All these things are a part of the case, and must be taken into account by those who would argue against an actual Shakespeare in the flesh. To a certain extent, they tell against the theory of non-existence; but then it is a question whether they tell for much. Look at them sternly, and see if they will not begin to melt away under your ardent gaze. Even those who stand to the idea that a poet who bore the name of Shakespeare lived in the flesh—wrote plays and poems—trod on the stage—owned shares in a theatre—made a little fortune by his pen—and died in Stratford-on-Avon—as the common story, told in a thousand books, asserts, will admit that this old idea of the Poet's life is based on all sorts of assumptions, contradictions and absurdities. Which of the facts put forth in the books have ever been proved? How do you know that Shakespeare wrote plays? You produce the copies; quarto, folio; 'Hamlet,' 'Othello,' and their bright compeers. Very good. But where is your evidence that Shakespeare wrote those plays? Where are the originals in Shakespeare's hand? You allow that none of them are to be found. Why are they not to be found? Shakespeare is not an ancient. Writings of his time abound in our public libraries. Spenser's manuscripts exist. Jonson's manuscripts exist. Bacon's manuscripts exist. Raleigh's manuscripts exist. Why of this great circle of contemporary authors should Shakespeare (if he really lived and wrote), and Shakespeare only, have left no originals to prove his right? You say the plays must have been burnt in the fire which destroyed the Globe Theatre. It is a common, an unhappy leap in the dark. How do you know that Shakespeare's manuscripts were kept in the Globe Theatre? Is it likely? Between the early plays and the later there was, according to the usual story, an interval of about thirty years. Some were written in London, some in Stratford. Some were produced at the Globe, some at Blackfriars, some at Court. Why should they all be kept in the Globe Theatre? Blackfriars was the chief establishment, and there, if anywhere in theatrical custody, the manuscripts should have been kept. But more. If a fire at the Globe were allowed, for the sake of argument, to have furnished a possible explanation for the disappearance of all the MS. Shakespeare plays, such an agency could only account for the plays. Where are the sonnets? Where is 'Lucrece'? Where is 'Venus and Adonis'? Still more, where are the private letters, the personal accounts, the noted and inscribed books belonging to this great reader and writer? Did they all perish in the Globe fire? This query would be pressed by a Strauss with relentless logic. A man's private letters are not easily destroyed. They are sent to many persons. They lie up in country houses, and are often preserved with religious care. Hundreds of Bacon's, Raleigh's, Cecil's letters—not a few of Donne's and Jonson's—are preserved. Yet not one scrap of ordinary writing, known to be Shakespeare's, has ever yet turned up. What is the meaning of this strange circumstance?

You say there are portraits; and you argue that a man who sits for his portrait must be a living man. The portraits answer for Shakespeare; but who will venture to say a word for the portraits? There is the rub. We know nothing whatever about these pretended portraits. We do not know that Shakespeare ever sat to a painter. We have no record of any artist ever painting him either with or without his consent. No contemporary ever mentioned a painting of him, good or bad. Moreover, the

pretended portraits are each unlike the other; and all are unlike Droueshout's engraving and Johnson's bust. The Chandos picture is of a different man from the birthplace picture; and neither work has a pedigree worth a straw. What, then, a critic of the destructive school might urge, is the value of an argument drawn from the existence of a dozen spurious portraits? No more than a Wardour Street ancestry for a grocer suddenly grown rich on sand.

But, says the fond believer in tradition, there is the house in which he was born; house in Henley Street, Stratford; once a butcher's shop, then a crumbling cottage, now a sacred shrine; restored, enlarged; made into a library, a museum, a picture gallery; surrounded by a pretty garden in which Shakespeare plants and flowers are taught to bloom. But alack! the house is only part of the general legend. Instead of the house answering for the fable, the fable is obliged to answer for the house. Shakespeare may have been born in Henley Street; but we do not know that he was so. It is probable, and some people believe it. But no Court could receive, in a case where so depended on the evidence, such probabilities as can be urged in behalf of the idea.

In truth, without going the length which a destructive critic might feel himself free to go, we must admit that very little of the common kind is known of our greatest writer. We are uncertain of his name. We find it in the forms of Chacksper and Shaxpur, and with twenty other variations, including Sapere and Shagspere. Critics cannot agree even now upon a common way of spelling Shakespeare's name; Malone, Knight and Collier having each his favourite delusion on the subject. We only know beyond doubt that the poet spelt his name one way in his books and another way in his will. We are uncertain as to when he was born and where he was born. We infer that he was born on the 23rd of April, 1564, in Henley Street; but we only infer the first from the circumstance of his being christened on the 26th of April, and the second from the fact of his father being then the owner of a house in Henley Street. Books have been written to show that he was not born on April 23. As regards the house, our only particle of evidence tells against the received idea. Shakespeare mentions it in his will; and he does not describe it as his birthplace. We are uncertain about his childhood and his youth,—where he went to school, what he learned, to what business he was put, why he left Warwickshire, and when he came to London. That he wrote poems and plays is matter of safer knowledge; though critics like Mr. Smith and Miss Bacon have not been slow in asserting that the poems and plays which go under his name were really written by Bacon and Raleigh, with a philosophical and revolutionary purpose. Beyond the facts of his being in London for some years, and producing plays and poems, scarcely anything is known with clearness. He wrote sonnets, which are the profoundest mystery in all literature. He retired from London to Stratford; but we are ignorant why, and when this change in his life took place. We see nothing of his married life, and we have only two or three lying stories about the companions of his social hours. The origin of the common tale of Raleigh founding the Mermaid Club, of which Shakespeare is said to have been a member, has not been traced. Is it older than Gifford? Nothing is known as to the cause of his death. His will makes no mention of books, papers, letters, manuscripts, or copyrights; a fact of the utmost singularity on the part of such a writer in such an age.

All these mysteries make us look upon the life of Shakspeare as the disgrace of our critical art.

And now we have in Mr. White a new, a well-prepared, and an unprofitable investigator of the common facts. Mr. White adds nothing to our scanty knowledge, and he overlooks some of the little that was previously made known. But his volume is thoughtful, and in places pleasant; and it will give to the American reader, for whose improvement it is written, a good idea of the country in which Shakspeare lived and died. The picture of Stratford-on-Avon, as this town appears to an American, will afford a favourable specimen of Mr. White's labours:—

"Stratford-on-Avon, where William Shakespeare was born and bred, is a place the antiquity of which is so great as to be uncertain. It was known as Stratford or Streaford, i. e. Street-ford, three hundred years before the Conquest. Having its origin probably in a wayside ale-house, boatman's cabin, or blacksmith's forge at a ford of the Avon river, on which it stands, it grew slowly to an insignificant size through long centuries. The Avon is one of those gently flowing rural streams which, unvexed by factories, undisturbed by traffic, and spanned by solid bridges which have sounded to the tread of mail-clad men, make the soil of England rich and her landscapes beautiful. The ford, which was the nucleus of the town, and gave it half its name, was on the high road or street which gave the other half, and which stretches from the hamlet of Henley-in-Arden through Stratford across the Avon on towards London; and thus the names of Shakespeare's native place, of the street on which stood his boyhood's home, and of his mother's family, were happily associated. Stratford is now a clean and quiet little place, containing about four thousand inhabitants, who seem to live comfortably enough without trade or manufactures. But in itself it has no attraction; and towards the end of the reign of that shrewd and selfish termagant whom our forefathers called Good Queen Bess, it would have appeared to modern eyes unsightly. It then contained about fifteen hundred inhabitants, who dwelt chiefly in thatched cottages, which straggled over the ground, too near together for rural beauty, too far apart to seem snug and neighbourly; and scattered through the gardens and orchards around the best of these were neglected stables, cow-yards, and sheep-cotes. Many of the meaner houses were without chimneys or glazed windows. The streets were cumbered with logs and blocks, and foul with offal, mud, muck-heaps, and reeking stable-refuse, the accumulation of which the town ordinances and the infliction of fines could not prevent, even before the doors of the better sort of people. The very first we hear of John Shakespeare himself, in 1552, is that he and a certain Humphrey Reynolds and Adrian Quiney 'fecerunt sterquinarium' in the quarter called Henley Street, against the order of the Court; for which dirty pieces of business they were '*in misericordia*', as they well deserved. But the next year John Shakespeare and Adrian Quiney repeated the unsavoury offence, and this time in company with the bailiff himself. This did not indicate a peculiar carelessness of dirt among the Stratford folk, at a time when in noblemen's houses, and even in palaces, the great halls, in which the household ate, were offensive, because the rushes with which the floors were strewed, by way of carpet, remained until they became mouldy, and beneath were bones and crusts, dogs' refuse, that were left there to decay. Launce gives us a glimpse of the habits and manners of those days, in that touching remonstrance which he addresses to Crab, upon his sad misbehaviour when he was presented to Madam Silvia. But, with the strange, sad incongruity of early times, although squalor and discomfort thus pervaded the little town of Stratford, it had public structures beautiful and venerable—such as now-a-days would not be erected in a place of fifty times its size. Now, a rich river-side city of fifty thousand inhabitants, nearly all of whom are comfortably, and a

large proportion of them elegantly, housed, is content to be approached over a serviceable wooden bridge, resting on strong, but homely, stone piers; the people worship according to their choice in various, perhaps pretty, but almost surely unpretending churches; if there be other market than those of convenience and cleanliness; and there is no private dwelling so superior and lofty, that it looks down upon the others round it as the homes of an inferior caste. But the little nest of plaster-walled, thatched-roofed cottages, most of them of a single floor, in which William Shakespeare was born, was approached by a noble stone bridge of fourteen arches, built at his own expense by Sir Hugh Clopton, a Stratford grandee and Mayor of London. The single parish church was a collegiate foundation, and had had a chantry of five priests. In size it was superior to, and in general appearance not unlike, the largest church in the United States, its namesake Trinity, in New York. Its interior walls were decorated with rude but striking fresco paintings, representing, among other subjects, some groups of the *Dance Macabre*, otherwise known as the *Dance of Death*; and around its aisles and chancel end were monuments and effigies of departed great folk of that neighbourhood. There was the Chapel of the Guild of the Holy Cross, a fine, well-proportioned building of the earlier Tudor style of ecclesiastical architecture, and some parts of it very much older, which, after the dissolution of religious houses by that conscientious Protestant, Henry the Eighth, had been used by the endowed and incorporated Grammar School of Stratford. The walls of this building were also decorated with paintings of sacred and historical subjects. In the open place, where the markets and the fairs were held, was a market cross with clock and belfry, from the steps of which the public crier performed his clamorous duty. Hard by the Chapel of the Guild was the Great House, or New Place, a grand mansion then a hundred years old, and more, built by Sir Hugh Clopton, of bridge memory, who lived and died there; and near the Great House was the college, a fine monastic structure, which had been converted into a dwelling, and where lived one John a Combe, a wealthy gentleman who lent money upon interest and good security. From the narrow limits of the town the country stretched away, with gentle undulations, into a broad expanse of meadows and cornfields, bright with grass and grain, laced with little brooks and divided by the ever stone-bridged Avon, dotted with old clumps of trees, darkened with remnants of the ancient forest, enlivened with rustic hamlets, and adorned with parks and gardens. Clopton House, old, manorial, and substantial, the home of Sir Hugh's family, was only two miles off; and about four miles distant, on another road, was Charlecote, a new country-seat built by Sir Thomas Lucy, in the form of an E, to please his royal mistress, insatiable of flattery. Only nine miles away was the county town, and the grand old feudal pile of Warwick Castle, dating back to the time of Alfred, of which William Shakespeare's maternal ancestor had been governor; and five miles farther was Kenilworth, not quite so old, but not less magnificent, where the Earl of Leicester, the Queen's favourite, was lately come as lord, and where within a few years he had spent 60,000*l.*, or, according to our present measure of value, \$1,500,000, in making the place grand and beautiful."

We do not care to follow Mr. White into the commonplaces of his volume. As a rule he believes in the old stories; even in Davenant's absurd tale of the thousand pounds, and in Gifford's apparent invention of the Mermaid Club. Prove to us, Mr. White, that Raleigh founded the Mermaid Club, that the wits attended it under his presidency, and you will have made a real contribution to our knowledge of Shakspeare's time, even if you fail to show that our Poet was a member of that Club.

In conclusion, we may say, that though the author is wanting in originality and in critical

powers, his enthusiasm for Shakspeare is great, his style crisp and pleasant, and his intention good. An index would improve the book.

*Class-Book of English Literature; with Biographical Sketches, Critical Notices and Illustrative Extracts. For the Use of Schools and Students.* By Robert Armstrong and Thomas Armstrong. (Edinburgh, Nelson & Sons.)

WHAT kind of "schools and students" can a book like this be useful to? Messrs. Robert and Thomas Armstrong, with an old class-book in hand, survey the course of English letters from the conversion of the Saxons to Christianity to the present day. It is needless to remark that they have attempted too much in so small a space. It is almost equally needless to say that had they known their subject they would never have made the attempt. The work of William and Robert Chambers would be more useful, and in every respect more satisfactory, if it contained twice its present number of illustrative passages; but it was planned on a large scale, that made liberal allowance for necessary quotations and biographical narratives, and though the editors omit much which they might have inserted with advantage, the volumes accomplish their object, and present primary students with a very entertaining and faithful outline of English literature. This commendation, however, would not be due to the work if, like this 'Class-Book of English Literature,' it had attempted to give the same amount of information in the twentieth part of its allotted space. In short, the volume is not a class-book, as we understand that term, but a dictionary, which says something about so many people that, for any practical purpose for which the student would refer to its pages, it says just nothing about any one. Samuel Richardson, the novelist, is honoured with twelve lines; Fielding is dismissed with fourteen lines of notices; whilst Tobias Smollett, whose nationality secures him more complimentary treatment, receives twenty-seven lines of commemoration; but no specimens are given from the prose fictions of any one of the three novelists. Again, when the authors venture to select passages for quotation, their choice seldom exhibits discrimination. For instance, however cordially they may recognize the *verve* and dash of 'The Charge of the Light Brigade,' and the exquisite freshness and purity of 'The Brook,' none of the Laureate's competent admirers would think that those two pieces fairly indicate the grander and finer characteristics of his poetry. The volume is full of blunders. For instance, George Crabbe is said to have been "born in the village of Aldborough, in Suffolk," whereas Aldborough, as its name implies, is an old borough town, and in Crabbe's days it sent two members to parliament. In the case of some poets such a slip would be trivial, and would not indicate ignorance of their works; but Crabbe's birthplace is known to every reader of his poetry as the "borough," whose aspect, streets, pursuits, and society he minutely described in an elaborate poem especially written for its glorification. Here and there the English of the joint authors is marked by inelegance and confusion of thought. For instance, in the memoir of Francis Bacon they say, "After the accession of James the First, he obtained the long-coveted dignity of Chancellor, and remained in high favour at court, until various acts of bribery alleged against him became the subject of an inquiry in the House of Commons. It was proved that on at least twenty-four occasions he had accepted sums of money from litigants, for the purpose of procuring a decision in their favour." To

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the authors' ignorance of historical facts we shall not object; they found these blunders in the old class-book; but the confusion of thought is probably their own. Bacon's enemies maintained that certain *suitors* paid him sums of money for the purpose of procuring decisions in their favour; but it never occurred to them to argue that he "accepted sums of money from litigants for the purpose of procuring" that which he gave. Here is another specimen of mal-arrangement which may be regarded as a good instance of the obscurity of dullness:—"As a means of subsistence," the authors observe, "literature was then so unremunerative, that when Johnson, on his arrival in the metropolis, informed Wilcox the bookseller how he intended to support himself, he expressed his disapproval by exclaiming that he had better purchase a porter's knot." What kind of "schools and students," we repeat, can such a book be meant for?

*The Pentateuch and Book of Joshua Critically Examined.* By the Rt. Rev. J. W. Colenso, D.D., Bishop of Natal. Part V. (Longmans & Co.)

Old Fuller says that children's clothes should be made of the biggest, because afterwards their bodies will grow up to their garments. To which he might have added that, make them as large as you may, the time will come when a new suit will be wanted. Churches have never understood this: they think their little boys will, when properly exhorted to that effect, contrive to make one dressing last their lives. The time comes when the seams begin to crack, the poor wearer having looked like a well-stuffed cushion no one knows how long: there is a terrible commotion among the old people: young Master Mind must have a new suit, and the tailor, and the stuff, and the cut, are all to be chosen at hardly any notice.

Our school of divinity is the most rigid in the world. The Roman Church, with infallibility always laid on, has a safety-valve which the English Establishment wants. There is a power of interpretation kept ready oiled, which can make present convenience be compatible with ancient authority without a hint of the process. But the English system has no living voice, unless the creaking of Convocation be allowed the name. The world—even its own world—laughs at it when it attempts to speak as one having authority, and not as the scribes. It is driven back upon its precedents and its decisions: the courts of law try to stuff the present into the past, and only succeed in a compromise which enlarges the past more than half way towards the size of the present.

God's message has a standing committee of explanation, self-appointed and self-sufficient, constantly occupied in preventing mankind from knowing more about it to-day than they knew yesterday. Their effort is to keep the words which were addressed to the children for the literal acceptance of the grown man. To few bishops is it given to see that the mind has its growth: that the average man is of a larger culture than he was two thousand years ago. The Homers and the Aristotles of the old day far exceed our ordinary type, we grant. These giants would still be giants, if they came among us as they were: but the growth of the species, the growth of the average, brings out of the whole mass of society a power which, by means of many acting together, produces effects such as even the giants could not rival. In physics and morals both, the union of small forces, aided by the perception of the way to apply them, gives to the united world a strength of which that of the old giants is but a feeble type.

Nothing is more extraordinary—on any hypothesis but one—than the way in which the Scriptures of the Old and New Testament lend themselves to this development of mind. When men were children, these books spoke to them as to children: when men become men, these books co-operate with them in putting away childish things. Our terms are comparative: we do not, when we talk of our contemporaries as men, mean more than older boys. We see others; we do not see ourselves. We feel the full absurdity of the theologian who tries to force us into the old jacket which fitted well enough centuries ago: the time may come—nay, will come—when a stronger and better race will give us credit for our good intentions and will smile at our course of action. In the meanwhile we may be sure that we are not to content ourselves with gazing at the water until we have learnt to swim.

Dr. Colenso is one of a school which is gaining force every day. In his particular case the outcry which hailed his appearance has almost entirely subsided. He now comes before us with his Fifth Part; the most bulky of the five. It is a book of 640 pages, besides 46 of preface, 686 in all. But Dr. Colenso will not come over us in this way. To hide his real number, he has put three fly-leaves into his paging, and has added fourteen pages of a description of Prof. Dozy's dissertation upon the probable Jewish origin of the rites at Mecca, no possible truth or falsehood of which can have anything to do with the right or wrong of his system. Deduct 20 from 686, and what remains? The genuine number of the pages of the book, and—well-a-day!—of the author.

The body of the work divides into two parts, 320 pages in each. The first is discursive and controversial; the book of Genesis analyzed and separated, and the ages of its writers determined. The second, the critical analysis of the book of Genesis, is, as it were, the dictionary of reference of the former part, going through the whole book in order of chapter and verse, and filling up many details. The appendices are, besides one already mentioned, an answer to Mr. Perowne and Bishop Browne on the Jehovahistic and Elohistic psalms, and a dissertation on the Phenician name of the Sun, IAO.

The critical analysis will be acknowledged by the Bishop's opponents to be a valuable addition to their means of knowing his and his predecessors' heresies,—a concordance to the discordances. We cannot notice its parts in detail. The synoptical table at the beginning ought to be separately printed and sold, that all who choose may mark their own Bibles. For the differences between the parts of the book of Genesis are differences, and mean something, whether Dr. Colenso's theory be right or wrong.

The conclusions of Dr. Colenso, in his Analysis, can be given nearly in his own words. A large portion of Joshua is due to the author of Deuteronomy, which therefore could not have been written by Moses. The Deuteronomist revised the other four books. About two-ninths of Genesis are Elohistic: this part contains peculiarities of phrase, 29 of which occur 10 times each, on an average, in the two-ninths, and not at all in the rest. And 100 "formulae" which occur on the average each more than 10 times—20 of them 47 times—in the other portions, do not appear in the Elohistic portions. Many discrepancies and contradictions are found between the Elohistic and the other parts. Other discrepancies give reason to conclude that ch. xiv. is the work of a second Jehovahistic writer, and that ch. xv. and some other passages are interpolations of the Deuteronomist. Three-fourths of the whole book being thus disposed of, about one-tenth of the

remainder, though Elohistic as to the name of God, is referred to a second Elohist. Dr. Colenso thinks that this second Elohist was really the Jehovahist at a different period of his life. The Elohist is supposed to have written in the latter years of Saul, and may have been Samuel: the Jehovahist is referred to the time of David and Solomon. The second Jehovahist is referred to the later time of David: the Deuteronomist to the time of Jeremiah. Dr. Colenso puts his dates together as follows: the prophets named are those who may have written the several portions, and, of all we know, are supposed most likely to have done so.—

	B.C.	Contemplated Prophet.
Elohist	1100—1000	Samuel.
Second Elohist }	1000—1010	Nathan.
Jehovist	1035	Gad.
Second Jehovahist	641—624	Jeremiah.
Deuteronomist		

Dr. Colenso examines the probable origin of the name Jehovah, and gives his reasons for supposing that it was gradually adopted by the Israelites after their entrance into Canaan, from their coming into contact with the Syro-Phenicians, with whom this name, or a name so like it as to be represented by Greek writers, Christian as well as heathen, by the very same letters, IAO, was the great mysterious name of their chief Deity, the Sun.

Here is many a point of controversy: and all will be inclined to think that Dr. Colenso seems to have arrived at a detail of separation which it will be wonderful if he can justify. It must be remembered that he comes at the end of a long train of critics, many of whom have shown great patience, learning, and ingenuity. We leave him on these points to time and thought: beyond all question he and his predecessors have shown that there is a field to cultivate, and that there are means which offer good prospect of a lasting result. Our concern with it is that a fair trial should be afforded; that honesty and zeal should not be put down either by force of law or by stress of clamour; and that those who would make religion a party to the inquiry into historical questions should be told in a voice to which they must listen that religion has nothing to do with the matter except this, that in all things whatsoever in which there is a true and a false, truth is of religion, and falsehood of the devil. Whether this last-mentioned word represent a person or a principle, to him or to it belongs the proposition that two and two make five; to God it belongs that two and two make four.

Here then, as before, we have more to do with Dr. Colenso in relation to his opponents than with the theologian and his doctrines. The opponent who is answered in this volume is Dr. Harold Browne, who was recently raised to the see of Ely, chiefly, it is believed, for his services in opposing the Essayists and Dr. Colenso. The new Bishop, as his senior admits, has written courteously and kindly; but not fairly. He charges Dr. Colenso, again and again, with having made assertions which stamp the whole Pentateuch with *forgery*. Now Dr. Colenso, as his readers know, and as he repeats, never charged Samuel—or whoever else collected the Elohistic narrative—with any intention to represent his work as divinely inspired, or as the writing of Moses. He never accused any one of passing off any part of Genesis for other than it really was. Bishop Browne himself says of the Pentateuch that "it is generally believed that it may have been put together after the time of Moses. It may have gone through some such changes as happened to the poems of Homer, collected by one, and re-edited by another." Surely Bishop Browne himself may be charged with representing the Law of Moses as a forgery, upon grounds as good as

those on which he has imputed a similar representation to Bishop Colenso. We make an extract from the first, and also from the passages in the former writings of the second, which conclusively settle the character of the more orthodox bishop—himself not quite orthodox—as a fair controversialist.

Bishop Browne says—

"Everything, then, tends to prove that the history of the Pentateuch must be in its main facts true. The people without question came out of Egypt, sojourned in the wilderness, conquered Canaan, and must have been both numerous and well trained, on such a conquest would have been impossible. This is exactly what the Pentateuch says, and what Bishop Colenso denies."

Bishop Browne made this assertion upon such of Dr. Colenso's passages as the following; we select one out of several of the same purport:—

"There is not, as has been said repeatedly already, the slightest reason to believe that the whole story is a pure fiction—that there was no residence of the Israelites in Egypt, no deliverance out of it. Upon consideration of the whole question, it is impossible not to feel that some real movement out of Egypt in former days *must* lie at the basis of the Elohistic story. It is almost inconceivable that such a narrative should have been written, without some real tradition giving the hint for it. What motive, for instance, could the writer have had, for taking his people down into Egypt, representing them as miserable slaves there, and bringing them out of Egypt into Canaan, unless he derived it from legendary recollections of some former residence of the Hebrews in Egypt under painful circumstances, and of some great deliverance?"

It is needless to go further into instances. In one sense Bishop Browne fairly states his own case: he candidly gives us to understand what kind of support it needs.

Another act of this drama is on the point of commencing: Dr. Colenso is now on his way to the Cape. He leaves this country victorious over all his enemies, in argument, in temper, and in law. In time to come, when the history of the struggle between old settlement and new inquiry shall be written for the nation at large, it will not be forgotten how stout a fight was fought by the first bishop who declared himself on the side of free inquiry, careless to what ends that free inquiry might conduct him. Dr. Colenso may be right, or he may be wrong: what he finds before him, the old notion that Genesis is one book written by a contemporary of the events, is certainly wrong, and is hardly upheld by any one who has made real inquiry. But, right or wrong,—and we predict for him much right and some wrong,—Dr. Colenso is right in his feelings, and right in his method: and he may take for his crest the plant growing towards the light.

There is an excellent analysis of the work in Longmans' quarterly circular, which we may safely believe was written by Dr. Colenso himself.

*Common Seaweeds.* By Mrs. L. Lane Clarke. (Warne & Co.)

*Common Shells of the Sea Shore.* By the Rev. J. G. Wood. (Warne & Co.)

"*The Sea-side and Back for Three Shillings*" has for several years past been a railway advertisement; and here we have a publisher of books offering the common sea-side weeds and shells for two shillings. Why, the sea-side with its life-marvels may now all be had for a crown! These manuals have, however, made their appearance too late for the present season, for few amateurs will care to begin weed and shell gathering after the September gales. When the blue, broad, growling waves have once shown their white teeth, collectors cease to be common objects upon the coasts. In September the sea-

side shifts its scenes. There is only a little chilliness perceptible in the air to the evening stroller on the esplanade, yet blue-jersey-wearing men are busy pulling up the bathing-machines from the beach,—the boats in which pleasure-parties yesterday glided over smooth, leaden blue water are hauled near the machines,—no flirting couples now sit or loll upon the beach,—boys with their shoes off do not paddle in the pools,—the donkeys, with loose-haired girls riding them, are not driven to the gallop by the donkey-drivers, raising the dust in the roads,—bath-chairs, perambulators, nursemaids, invalids and babies become less prominent,—and none but veterans or enthusiasts venture with shrimpers and prawners, line and seine-net fishermen, to explore the lowest rock pools for fossils, weeds, shells, crabs, or fishes. Victims then become scarcer in the lodging-houses and the lobster-pots. To Brighton and Hastings, the marine promenades of the West-End society of the British metropolis, especially in October and November, of course these observations do not apply; but certainly in reference to pure and genuine sea-side places, towns and villages, and the people to whom cheap books on weeds and shells are addressed, they come in September, like Louis-Philippe's concessions on the barricades, "too late."

The lady who has compiled '*Common Seaweeds*' has done her work much better than the gentleman who has done '*Common Shells*'. Mrs. L. Lane Clarke, we can well believe, has in her little manual restricted herself to the seaweeds she knew to be most valuable for album or fancy-work,—writing from her own collection, and looking into the tide-pools day by day. But she gives at least two questionable instructions. She recommends the use of a porcupine-quill or a needle in arranging the specimen when floating in fresh water prior to being transferred to the paper. But these instruments destroy the grace of nature, and a small camel-hair brush lays the fronds out much better. Again, she tells her pupils how to make the plants adhere to the paper, which is exactly what they ought never to do, for the adherence destroys the more delicate parts of valuable specimens, which are best fixed by means of tiny gummed and concealed slips of paper.

Mr. J. G. Wood has compiled many books on Natural History without showing much knowledge either of books or things. He, it is plain, has neither written from his own collection, nor has he been examining the rocks, sands or pools day by day. In proof of these strictures, take the piddick or pholas, a very common bivalve on the coasts nearest London. In the illustrations by Mr. G. B. Sowerby of '*Common Objects of the Sea Shore*', published in 1857, and in '*Common Shells*', just out, the roseleaf-like foot of the piddick is drawn with what may be called the tip of the leaf where the stalk end ought to be. Mr. Wood, moreover, says the colour of the shell is white,—proving thus that neither the illustrator nor the compiler has ever hewn a living pholas out of the rock, or seen any but cabinet specimens; for until bleached white the shell is purple, and the foot the shape of the gap in which it works. Mr. Wood also reads as carelessly as he observes. Numerous accounts have been published during the last fourteen years in every civilized country and language of the boring process of the pholas; and machines formed on the model of its mechanism have for years been tunnelling Mont Cenis. Yet, although now aware that the problem has been solved, Mr. Wood is wrong in almost everything he says about it; for the piddick is not like a bradawl, and does not wash out its hole, being, in fact,

a living rasp and squirt. Compilers who write to plates, work under great disadvantages, no doubt; but the public interest demands the reiteration of the truth, that the compiler who knows the group of plants or animals he writes about infuses something of the quickness and brightness of life into the driest details, while the compiler who does not know the living things makes every plant or animal he touches dull and deathlike.

'*Common Seaweeds*' and '*Common Shells*', all drawbacks notwithstanding, are small manuals worth their price; although we must add, that for a little more money guides may be bought better worth the outlay.

#### NEW NOVELS.

*Constance Sherwood: an Autobiography of the Sixteenth Century.* By Lady Georgiana Fullerton. 3 vols. (Bentley.)

TALES of religious persecution are always heroic. The story of sufferings borne for the sake of a creed, which the sufferers believe to be the one supreme form of religious truth, through which alone their prayers to the "God and Father of all" can be offered, have the power to make the heart of every generous reader burn within him, for they appeal to the deepest instincts and highest sympathies of our human nature. This sympathy is quite irrespective of the creed of the sufferers. In stories, all the political elements which gave rise to the strife are kept out of sight, and we are shown only the innocent victims to the stern laws of the dominant party in troublous times. So, whether they be tales of the early Christians, persecuted under the Roman Emperors, tales of Christians persecuted by other Christians for points of inaccuracy in their formulas, persecutions of the Albigenses, persecutions of the Huguenots, persecutions of the early Reformation by the Church Regnant, or persecutions of the Roman Catholics when the Reformed Church became dominant in England, or the cruelties against the Covenanters in Scotland, the reader can feel only sympathy with the victims. Martyrs give the supreme testimony to the faith for which they suffer, and every fellow-creature who reads their story feels proud of their courage and constancy. But that is because the political passions, the fear, and the deadly strife of tongues have all passed away, and left us capable of discerning

The still, sad music of humanity, which was ever going on in the midst of the "confused noise and the garments rolled in blood." We recognize in the sufferers men and brethren, now that they can no more offend us by their diversities of opinion. It is only on the surface of the ocean that the waters rage and swell; a very little way below the surface is perfect calm. Lady Georgiana Fullerton has chosen for her theme the sufferings that religious Catholics had to incur in the early days of the Reformation, when Spanish Armadas, Papist conspiracies, and a Roman Catholic pretender to the throne, gave rise to penal laws against the Roman Catholics as severe and stringent as the fears of the dominant party could devise or their power enforce. Swarms of contemptible informers and "base betrayers of their brother's blood" arose—as they have done in all times of persecution, as they will ever do.

In her story Lady Georgiana introduces the record of most of the Roman Catholic sufferers whose names are many of them little known to the Protestant general reader, but which are carefully enshrined in the memory of their own Church. She also speaks of other men as saints and martyrs, who were deeply involved

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in the intricate politics and conspiracies of the period, and who suffered for them quite as much as for their religion. She paints from the Roman Catholic point of view, and keeps entirely to the religious aspect of the struggle. In her pages the Catholics are oppressed men, only desirous of worshipping with freedom in their own manner,—which the laws then existing forbade under pain of death and confiscation. Lady Georgiana Fullerton always writes with grace and refinement. She does not give highly-wrought scenes of horror; on the contrary, she is studiously self-restrained and moderate. The heroine is a fictitious personage; a certain Mistress Constance Sherwood, a gentlewoman, in the reign of Queen Elizabeth, much attached to the ancient faith, and connected, either by consanguinity or friendship, with many notable persons who suffered for their adherence to their religion. Most of the secondary personages are real people, and the incidents narrated are, for the most part, quite true. The references are given at the end of the third volume. The story of 'Constance Sherwood' is a touching picture of life under a reign of terror and penal laws. There is no plot; it is merely the record of the life of Constance Sherwood from year to year,—of the fears, temptations, and difficulties, under which she and her friends held fast their faith; and of the testimony which many amongst them sealed with their blood. The passages in the life of the Countess of Arundel and Surrey are taken from the history of that noble house. Of course everything that could jar upon the reader's sympathy is kept out of sight, and all the Catholics in the book are the most excellent of the earth. The incidents of heroic generosity and self-sacrifice are told with a chastened enthusiasm, which increases the reader's admiration. The sentiments which all the Catholics express are of the purest and noblest religious virtue,—such as all Christian men and women ought to feel.

Lady Georgiana Fullerton has written a book which no one can read without deep interest; and she has written it in an admirable spirit. Substituting the Reformed religion for the Roman Catholic, it is just such a work as a pious Protestant might have written concerning the troubles, in the reign of Queen Mary, which befell all who would not attend the celebration of mass.

*Who is the Heir?* By Mortimer Collins. 3 vols. (Maxwell.)

Mr. Collins has written three clever volumes; but something more than clever writing is needed to make a novel. We want a consistent story, an atmosphere in which people might move, and people in whom we might believe. Nor is the void filled up by brilliant writing and wealth of apt quotation,—by allusions to every passing event, whether secret or notorious,—and by pictures of a luxury that would be overpowering if it was not impossible. We admit that these are pleasant elements in any kind of work, but we have had so much of them already that we cannot give undiminished praise to their repetition. All these strawberry breakfasts, and dark, dreamy eyes, and Latin verses worthy of Catullus, and peaches and pines, and crystal bowls of ice, and fretted flasks of marvellous vintages, are delightful to read about for a time; but, after all, they pall upon us. Is it so certain that the people who can indulge in such luxuries retain their appetite to the last? Are not half of them dyspeptic, or *blasés*, or born without a taste, and afraid to show the defect? Mr. Collins has endowed all his heroes with the capacity of Guy Livingstone; but the only result is that he reminds us too much of that undesirable type. Without

emulating the wickedness or the blackguardism of Mr. Lawrence's men, Mr. Collins borrows too much of their marvellous strength and indulgence. There is an atmosphere shed over his story as if he was inspired by recollections of those novels, just as his sprightly dialogue reminds us of 'Wheat and Tares' or 'Late Laurels.' We are gradually led to the conclusion that we have before us a man of ability wanting to see what he can do by a mixture of two or three styles that have pleased him and have taken with the public. The key-note has been struck by Mr. Disraeli, who has evidently a great admirer and a loving student in Mr. Mortimer Collins. Perhaps it would have been well if the disciple had not followed his master so faithfully in one of his characteristics. The personalities which flavour 'Who is the Heir?' are as little concealed as any of Mr. Disraeli's portraiture. No one can fail to recognize Cheiron and Caversham, Roxham and D'Almeida. But when Mr. Collins comes to his own immediate circle of acquaintances, to men who are not so conspicuous in the great world as the leaders of the two Houses, he ought to have adopted more disguise. Young Wynyard Powys and others of the same age will hardly care to see themselves at Mudie's except on their own title-pages; and the world at large, which scarcely knows their title-pages, will see that it is kept out of some secret, and will resent the superfluous mystery.

There is an attempt at a story in 'Who is the Heir?' and though Mr. Collins apologizes for not keeping up a mystification like Mr. Wilkie Collins or Mr. Sheridan Le Fanu, he does keep one up till an advanced part of the third volume. We shall not tell it, nor even hint at it. As we are pretty well practised in novel-reading, and have our idea about the legitimate sources of plot in fiction, we will only say, that some of the mysteries are too absurd, and some of the means of detection too simple. The abduction of Lily Luttrell, for instance, is too great a tax on the reader's credulity; and the sham claim on the Mauleverer estates is too sham to impose on the most credulous. The episode of the bagman hearing that a rich widow was staying at a farm-house, and making up his mind that by asking shelter there he would gain her hand, is beneath so clear-sighted an author as Mr. Collins. But story is not his strong point. He excels in description, and he is felicitous in dialogue. We could quote many epigrams from the three volumes, light, graceful verses, happy hits in prose, which would make the fortune of a stupid novel. Mr. Collins is one of those Tories whose political principle is opposition to the rising classes; one of those men who believe in good blood, in chivalry and polish, and who would, therefore, keep down the young men who have not yet made their proofs of all the three, in favour of the older men who have tried to make their proofs and failed. Yet we ought not to despair of Mr. Collins's conversion. His chief hero, Guy Luttrell, almost a namesake and more than almost a reminiscence of Guy Darrell, gives up politics, England, and his future because his faith in Toryism has suddenly been shaken. The heroine, who had agreed to be his wife, says she must give him up because she cannot marry any one but a Tory; "the Ashleighs have always been Tories, and I have always felt as if people who were not Tories belonged to some different race;" and he goes off to Africa. But his plunge into the desert ocean strengthens him, and he comes back to win her, convinced that the world has profounder ideas than Toryism or Whiggery. We hope Mr. Collins's plunge into the ocean of novels will have the same effect on him.

*Uncle Clive: a Tale.* By C. A. M. W. (Newby.)

THERE is no lack of spirit in this story, and the humorous portions are sometimes decidedly good. It is not indeed very amusing to read the numerous speeches of a lady who *lithpith* (as she would pronounce it herself) from the beginning to the end of the volume. Such a character, however, would be comical on the stage; and we imagine, from the farcical nature of some of the incidents in the book, that the drama is C. A. M. W.'s legitimate sphere of action. The great coin-collector, Mr. Simon Purvis, is just such a gullible and absent individual as stage antiquaries have been from time immemorial. At his sister's wedding he pulls out his handkerchief, and with it a cherished Egyptian coin, which rolls into an obscure corner, as cherished coins, when dropped, are apt to do. Mr. Simon, in an agony of fear, exclaims aloud, "Oh, my Cleopatra!" whereat a matter-of-fact old lady is deeply touched, and whispers to her neighbour, "I thought her name was Julia,—it's quite affecting to see such brotherly love." Of Uncle Clive himself we need not say much, as he is kept in the background during almost the whole of the story. His mysterious appearance clears up some of the difficulties of the plot, while his make-up as a supposed rival antiquary, and Mr. Simon Purvis's fussy anxiety to fraternize with him as such, are points from which the author knows how to extract the comic elements. The cleverest (albeit the most extravagant) thing in the book is the bold artifice by which Maud Trevanion gets rid of her timid lover, Napoleon Yeates. By her Uncle Clive's direction, she is to have a good fortune if she marries Napoleon, or if he refuses her; but she is to lose it if she refuses him. She despises Napoleon, and secretly vows not to marry him; but she by no means despises the fortune, and she determines, at all hazards, to keep it. The question is, then, as she must not refuse Napoleon, how to get him to refuse her. We have seen something of this kind more than once before, but the idea is here so completely and humorously worked out, that we must pardon the want of novelty. The author would do well to get rid of a taste for sermonizing, which is scarcely in keeping with the lighter play of his fancy. Ghost-stories, too, should be avoided, unless accompanied by a proper explanation, or a bold confession of faith.

*Recollections of my Life*—[*Erinnerungen aus meinem Leben*, von Adolf Bernhard Marx]. 2 vols. (Berlin, Janke.)

THOSE elderly gentlemen who so often entertain us with their personal reminiscences forget that two things are necessary for their task: they must have something to remember, and they must be able to remember it. In very many cases we miss both these requirements. A man has lived with great contemporaries, has seen them and has talked with them. When he gets old, he finds that the world is curious to know something of the great men to whom he can allude so familiarly,—why should not he write down his impressions of them? But when he comes to write down his impressions, they turn out to be of the faintest possible kind. He never got beyond the husk with half of these men; he does not quite remember what was the look of the husk. However, he has pledged himself to write, and he must write; so the public has the gratification of learning that at a certain date—to far off to be stated exactly—the autobiographer dined with a certain great man; and that a few days

afterwards he made a digestive call, when the great man was "not at home."

This is really not an exaggerated description of many books of the kind. The one we have before us answers to it in some respects, and disappoints us grievously about some of its characters. The names with which the Table of Contents is thickly strewn are attractive, but sometimes the name occupies as much space in the table as in the contents. Even the people to whom a whole chapter is dedicated leave us at the end of it almost as faint as they were at the beginning. One chapter is devoted to Mendelssohn and two chapters to Spontini; yet they give us little of the author's intercourse with two such celebrities, and still less of his impressions of them. The book is fragmentary in the extreme; and there is the less excuse for it, as the author is a practised penman—the writer of works on Beethoven and Gluck, on music and musical composition. However, it contains something that is worthy of reading, and much that is worthy of skimming; some elucidations of character, especially the author's own character; and a very fair proportion of anecdote.

What chiefly strikes us in the author is the paradoxical nature of the motives which dictated all his actions. He was of Jewish parentage, and his father a most stiff-necked Jew, believing in nothing but Voltaire. The son was apparently led to take an unfavourable view of the Jewish religion by witnessing the deceit of the women who spent the long night of fasting in the Temple. He saw them one by one complain of exhaustion, and slip off into a side room, where their servants waited for them with a well-filled basket, and from whence they soon returned marvellously refreshed. But the instruments of our author's conversion to Christianity, and the Lutheran form of Christianity, were Mozart's 'Requiem' and Handel's 'Messiah.' The latter work led him to study the Bible, and his admiration for the Bible made him a convert. On hearing of his intention, his father, the Voltairian Jew, laid himself on his bed, and declared he would not survive his son's apostasy. But the son was convinced that this was only a temporary dissatisfaction, and paid no attention to the threat. "My father," he says, "remained in good health, and lived many years after." In like manner, what led Herr Marx to compose was an account of a composer who had devoted six sonatas to the description of a quarrel between a married couple. The youth never noticed the tasteless folly of such a musical attempt, but deduced from it that music "was able to reproduce more definite ideas." He went at once to a music-seller, and asked for the six sonatas, but they were not to be had, and instead of them he was given something of a very different description—a sonata of Beethoven's. A third paradoxical act was the formation of his friendship with Mendelssohn. He played a psalm of his composition to Mendelssohn, and waited anxiously for the young musician's judgment. Mendelssohn looked through the partition, first with astonishment, then with several shakes of his head, and exclaimed, at length, "No, that will not do at all; that is not right; this (pointing to Herr Marx's attempt at a fugue) is not music!" Herr Marx was enraptured! This was frankness!—We think every one will agree with him that it was.

His friendship with Mendelssohn did not last, but one fruit of it was that Herr Marx agreed to write words for Mendelssohn's oratorio 'Paulus,' and Mendelssohn wrote words for Herr Marx's oratorio 'Moses.' At the house of the Mendelssohns, Herr Marx met Heine; and he gives us the following picture:—"I have a most lively recollection of the young

slender, aye, elegantly-formed man, as he leaned across the table at Mendelssohn's, with the imitable grace of languid weariness and lassitude; and said, in drawing, and by no means whispered tones, to Rebecca, the youngest daughter of the house, who was enthusiastic for his poems, 'I could love you.' She turned away, either to hide her laughter or her girlish anger." Mendelssohn wanted, at one time, to write an opera on Shakspeare's 'Tempest,' and consulted Herr Marx about it. Though Herr Marx was not sanguine on the subject, he did not try to dissuade Mendelssohn, who had already confided the *libretto* to Immermann; but when the *libretto* came it was impracticable, and Mendelssohn abandoned all idea of setting it to music. Another point in connexion with Mendelssohn as an operatic composer is Spontini's judgment of his first opera, 'The Marriage of Gamacho.' Spontini lived in the Gendarmes Platz, at Berlin, opposite the church of St. Hedwig, which is an imitation of the Pantheon. It was to this church that Spontini called Mendelssohn's attention, saying to him, "Mon ami, il vous faut des idées grandes comme cette coupole." When Wagner was on the point of commencing his career as an operatic composer, he called on Spontini, and the veteran received the beginner graciously. "But," he asked him, "what do you want to write? what scene are you going to choose for your operas? Rome? There is my 'Vestal.' Greece? There is my 'Olympia.' Do you think of India? There is my 'Nourmahal.' Do you dream of the East, with its enchanters and genii? There is my 'Alcidor.' The Middle Ages? I have described them in 'Agnes of Hohenstaufen.'" Of course Spontini could not foresee that Wagner would keep so clear of his ground. The thought of such subjects as 'Tannhäuser' and 'Lohengrin,' the 'Nibelungen' and 'The Flying Dutchman,' never entered into the Italian's brain, any more than the thought of composing without music, and writing for the present by means of the future.

Herr Marx, who was born in Halle, saw the French troops and Napoleon himself enter that town after the battle of Jena. He was surprised at the little men in yellow or blue who were called the French and had beaten "our tree-like grenadiers"; but the sight of Napoleon impressed him deeply. He and his father had taken up a good place, and were waiting anxiously for the Emperor, when a troop of French insisted on their showing it the way to their quarters. The two sightseers had to yield, and were going off sadly, till the sight of a group of officers inspired the Voltairian Jew, and he complained loudly in French of the hardship to which he was subjected. The officers took his part, sent away his oppressors, and got him and his son a better place than before. The boy had no eyes for the glittering train; he saw only the Emperor, with his "ancient Roman, yellow-pale countenance, the sharply-cut lines, immovable as bronze, and the grey eyes, so clear and yet so deep." A much smaller celebrity of later time was Schelling, whom Herr Marx saw at Berlin, engaged in the crusade against Hegel, which was undertaken at the desire of Frederick William the Fourth. Schelling lived in mystical retirement; visitors were brought through the dark shades of a garden, and left to wait in a room till the doors opened and the old man appeared, in a long flowing robe, with the solemnity of a magician. His first lecture was attended by great crowds of hearers, among whom were the majority of Hegel's pupils. Turning to these, he said, "Your philosophy, gentlemen, has led you into a blind alley. Follow me, and I will bring you out into the light." And so he did,

but not as he intended. The greater part of his hearers left the room long before the end of his lecture.

We close with one of Herr Marx's experiences as a musical teacher:—"I soon saw that my first pupil in singing had no idea of the meaning of the words she sang. I therefore requested her always to give me an account of the poem beforehand. One day she was going to sing one of the settings of Goethe's 'King of Thule.' While explaining it, we came to the last verse,

Die Augen gingen ihm über,  
Trank nie einen Tropfen mehr;

and I asked her its meaning. 'Ah!' she replied, modestly, as much as to say, 'Pray don't ask me. At last, on my urging her in a friendly way, she faltered out, 'He was drunk.'

One need not have lived with great men to tell such stories as this; but we confess that we would gladly have had more about Mendelssohn and less about nameless contemporaries. The memory which serves so well in things of little importance, ought to have been fuller when it came to those most worthy of retention.

*An Irish-English Dictionary.* By Edward O'Reilly. A New Edition, with a Supplement containing many thousand Irish Words; by John O'Donovan, LL.D. (Duffy.)

THE intending student of Irish will hardly be encouraged by the information he will find at page 581 of this Dictionary, on the authority of a certain Thady O'Rody, who wrote as follows in the year 1700:—"The Irish is the most difficult and copious language in the world, having five dialects—viz., the common Irish, the poetic, the law or lawyer's dialect, the abstractive and separative dialects; each of them five dialects (*sic*) being as copious as any other language, so that a man may be perfect in one, two, three, or four of these dialects and not understand even a word in the other, contrary to all other languages, so that there are now several in Ireland perfect in two or three of these dialects, but none in all, being useless in these times." This not very lucid statement is something of a piece with the observation of Campion, in 1571, that "the true Irish indeed differeth so much from that they commonly speake, that scarce one among fivescore can either write, read, or understand it." That there is some foundation for these assertions is evident from the fact that in the two editions of the great source of Irish history, 'The Annals of the Four Masters,' published within the last fifty years, by O'Conor and O'Donovan, the editors differ in the translation of several passages, though each was esteemed the best Irish scholar of his time. But that there is also much exaggeration is just as evident. It is by no means a peculiarity of Irish that "the law or lawyer's dialect" should be unintelligible to clients; and how often is it found in England that the medical dialect is unintelligible to a coroner's jury!

The difficulties in the way of acquiring Irish being, according to Thady O'Rody, of so formidable a nature even to the natives, it is no wonder that the study has not been a favourite with foreigners. On the very threshold they are met with a peculiar alphabet of it, it is true, only seventeen letters; but as these correspond exactly with seventeen in the Roman alphabet, it seems a pity that the influence of Rome, so powerful in other matters, should in this particular be ineffective. The spelling is full of eccentricities which beside even that of French and English spelling looks tame. The silent letters are so numerous as in every printed page to waste about one-fourth of the space.

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The hill which O'Connell was so fond of introducing into his speeches is spelt in English, Tara, but in Irish, "Teamhragh." Pronunciation goes so strangely astray that the name of Adam, which is written Adhamh, is sounded Aw-oo. Under these circumstances a pronouncing dictionary would, to the student of Irish, be a boon indeed, but it is one that may apparently be looked for in vain. In the first part of the book before us the space that might have afforded this information is wasted in spelling each word twice over,—first in Irish letters, then in the exactly corresponding Roman ones,—a process which is entirely useless, and swells the bulk of the volume by about a hundred pages.

Apart from this drawback, the work is one of merit and utility. It is divided into two portions or alphabets, one devoted to Irish as it is, the other to Irish as it was. The first is a re-impresion of a dictionary by O'Reilly, first published in 1817; the second a so-called "Supplement" or Glossary, by a far superior man, the late Dr. O'Donovan. O'Reilly's portion is a compilation from previous dictionaries, and from the manuscript memoranda of William Halliday, a young and ardent philologist whose name deserves to be held in honour, who published an Irish grammar and was preparing an Irish dictionary when struck by death at the age of twenty-three. O'Reilly's original preface contains a curious confession, which is surely characteristic of the nation as well as the man: "When I was making my collection," he states, "it never occurred to me that the words used daily in common conversation and familiar to myself might have been omitted by former compilers; and taking it for granted that they were not omitted, I never examined further into the matter, but proceeded with the printing of my work, and had nearly finished it before perceiving the omission." All the most useful words, therefore, had to be inserted by this model of lexicographers in a supplement. This supplement is now incorporated with the main body of the dictionary, and the two combined form, as we have said, a tolerably useful though not an ingenious or learned compilation—a valuable instalment of a better book to come.

The new Supplement, from the pen of the late Dr. O'Donovan, is so different in its object, plan, and execution from the work of O'Reilly, that it would have been injudicious to combine them in one alphabet. It is chiefly a glossary of the ancient Irish, giving forms and expressions now obsolete, which would be unintelligible without explanation, even to those who speak the language. These are copiously accompanied, we cannot say illustrated, by extracts from old manuscripts, of which, unfortunately, no translation is generally given. The materials are apparently presented to the reader as Dr. O'Donovan left them at his death, without having been subjected to any editorship. One odd effect of this is, that the terms extracted from Zeuss's 'Grammatica Celtaica,' which has supplied a good many, are explained in Latin only, with a reference to the page of Zeuss, as thus:—"Remdedolta, anteluanus, Z. i., 84; Remfuirmeochea, prepositive, Z. i., 33; Remtechar, antepositive, Z. 985." Such memoranda as these would, no doubt, have been very useful to Dr. O'Donovan, who would, by referring to his copy of Zeuss, have been able to ascertain from what manuscript they were taken, and thus to form a conjecture of the date when the terms were in use; but why, in the name of common sense, are they laid before the general public in a state so crude?

As a spoken language, the Irish, or, as it should rather be called, the Erse, is apparently

dying away. The literary glories of Ireland are connected with another language—that of Swift, Goldsmith and Moore, who were all three as little acquainted with the speech of Connemara as Scott with Gaelic. But, for the purposes of history and philology, the language of 'The Annals of the Four Masters' and the Breton Laws is deserving of at least ten times the amount of study it has hitherto received; and for those who enter on this hitherto neglected field of inquiry this volume will be found indispensable.

#### OUR LIBRARY TABLE.

*The Revolution in the French Army. The Election of Subaltern Officers in 1849—[Révolution dans l'Armée Française, &c., par Boichot, Membre de l'Assemblée Législative]. (Brussels, Mertens & Son ; London, Jeffs.)*

WITHIN a year of the *coup d'état* of the 2nd of December, M. Schoelcher published his well-known and singular account of that episode in French history. Sergeant Boichot has allowed sixteen years to pass before he gives what may be called the introductory chapters to M. Schoelcher's work, —the Sergeant's sketch, namely, of the intrigues of 1849. This unpretending sketch is worth reading. The author was elected, chiefly by the votes and active agency of his comrades, to the Legislative Assembly. As an ardent democrat and socialist, his election was frowned upon by the military authorities. Counsel, remonstrance, menace, and flattery, on the part of various Generals, failed to induce the Sergeant to resign the civil dignity to which he had been raised. He placed his citizenship above his soldiership, and suffered in both respects. Under the second empire, the military upholder of the "République démocratique et sociale" writes, in exile, his brief reminiscences of the time when his regiment broke into mutiny that they might support order.

We have on our table the following Pamphlets:—*The Anniversary Address delivered before the Anthropological Society of London, January 3rd, 1865*, dedicated to the British Association for the Advancement of Science, by James Hunt, Ph.D. (Trübner & Co.),—*The Annual Report of the Baptist Missionary Society for the Year ending March 31, 1865*, being a Continuation of the Periodical Accounts relating to the Society (Houlston & Wright),—*Journal of the Asiatic Society of Bengal*, edited by the Secretaries (Calcutta, Baptist Mission Press),—Part I. of *Practice with Science, a Series of Agricultural Papers* (Longmans),—*The Climate of San Remo, as adapted to Invalids*, by Henry Daubeny, M. D. (Longmans),—*The Cattle Plague, with Suggestions for its Treatment by Homoeopathy*, by James Moore, M.R.C.V.S. (Simpkin, Marshall & Co.),—*An Inquiry into the Possibility of Restoring the Life of Warm-Blooded Animals in certain Cases where the Respiration, the Circulation, and the ordinary Manifestation of Organic Motion are Exhausted, or have Ceased*, by Benjamin Ward Richardson, M.A., M.D.,—*Diarrhœa and Cholera, their Origin, Proximate Cause, and Cure, through the Agency of the Nervous System by Means of Ice*, by John Chapman, M.D. (Trübner & Co.),—*A Glance at the Progress of Medical Science, and at some Phases of Medical Faith*, by Edward Ellis, M.D. (Churchill & Sons),—*Sanitary Statistics and Proceedings in St. Giles's District*, by George Buchanan, M.D., Medical Officer of Health (Penny),—*On the Efficacy of Bromide of Potassium in Epilepsy and Certain Psychical Affections*, by S. W. Duckworth Williams, M.D. (Churchill & Sons),—No. III. of *Photographs of Eminent Medical Men of all Countries, with Brief Analytical Notices of their Works*, edited by S. Herbert Baker, M.D., the Photographic Portraits from Life, by Ernest Edwards, B.A. (Churchill & Sons),—*General Civil Code for all the German Hereditary Provinces of the Austrian Monarchy*, translated by Joseph M. Chevalier De Winimarter (Dulau & Co.),—*Speech delivered by the Hon. Joseph Howe at the Detroit Convention, on the Commercial Relations of Great Britain and the United States, August 14, 1865* (Stanford),—*The Camberwell*

*Grammar School. A Statement of the Past and Present History and Condition of this Charity, with Suggestions for the Appointment of Governors, and the Settlement of a Scheme for its future Management*, by Charles Mott,—and *Mistresses and Servants*, by Internuncio (Shaw & Co.).

#### LIST OF NEW BOOKS.

Arabian Nights, Dalziel's illust. edit. Vol. 2, imp. 8vo. 7/6 cl.  
Arno's Elements of Physics, Part 2, 8vo. 10/6 cl.  
Art and Mystery of Making British Wines, cr. 8vo. 7/6 cl.  
Biggs' (John) *Book of Gardening*, &c., post 8vo. 7/6 cl.  
De Vere's Handbook of Cutting, Part 2, oblong, 5/6 cl.  
Domani's *Cathedral, and other Poems*, 12mo. 4/6 cl.  
Ernest Elton, the *Lane Boy*, fo. 8vo. 2/6 cl.  
Harriet Martineau's *Life in Russia*, cr. 8vo. 7/6 cl.  
Hilditch's *Every-Day Papers*, new edit. cr. 8vo. 6/ cl.  
Harvey's Restoration of Nervous Function, 8vo. 5/ cl.  
Hint (A) for the Homework Bound, by a Clergyman, fc. 8vo. 2/6 cl.  
Howard's Seven Lectures on Scripture and Science, cr. 8vo. 2/6 cl.  
John (Peter) *Life and Spectre of*, cr. 8vo. 3/6 cl.  
King's *The Lady of Wilmot*, 3 vols., post 8vo. 21/ cl.  
Montgomery's *The Buckley Shag*, 2 vols., post 8vo. 21/ cl.  
Nashby's *Papers (The)*, by "Petroleum Nasby," fc. 8vo. 1/ cl.  
Nichols's *Story of the Great March*, post 8vo. 7/6 cl.  
Old Remond's *Principles in Medicine*, 12mo. 4/6 cl.  
Sadler's *Marian Books*, 3 vols., post 8vo. 24/ cl.  
Trafalgar's *Geeth of Fen Court*, new edit. cr. 8vo. 6/ cl.  
Willis's *David Chantrey*, 3 vols., post 8vo. 31/ cl.  
Wright's Collection of Problems &c., *Theorems*, 12mo. 6/6 cl.

#### ADMIRAL W. H. SMYTH.

DIED, on Saturday, the 9th instant, at St. John's Lodge, near Aylesbury, Admiral William Henry Smyth, the leader of the present race of naval surveyors. His age was, we see it stated, about seventy-seven: his commander's commission is dated 1815.

After serving through the war, especially on the coasts of Spain and Italy, he turned his attention to the state of the Mediterranean charts. He had previously served in the Indian seas, in the Akbar frigate. This ship he left in 1808: he next saw her at Liverpool, moored as a school-frigate, or reformatory, in 1856, after he had obtained his flag. He begged for a morsel of her timber; and a large fragment of the bitts was sent to St. John's Lodge. The arrival was celebrated by a copy of verses in his peculiar style, a mixture of burlesque and feeling, rough and effective.

He had observed the defects of the Mediterranean charts during his early service; and had made efforts to correct some points. After the peace he continued his observations unaided, and at his own expense, until in 1817 the Admiralty sent him out a ship. He continued his survey until 1824, and produced that collection of charts which became so well known among seamen. His work on Sicily was equally well known at the time, and a work on the Mediterranean, published in 1854, contains an immense hoard of miscellaneous information.

On his return to England, after some time expended in the completion of his charts, he settled at Bedford, to avail himself of the school for the education of his sons. Here he built an observatory, furnished it with good instruments, and made that long series of observations on double stars which he published in the *Bedford Catalogue*, in two volumes, the first of which is a valuable repertory of miscellaneous astronomy. This series of observations obtained the Astronomical Society's gold medal. On quitting Bedford, he resided for some years at Chelsea, and then settled at St. John's Lodge, near Aylesbury. This residence is close to Hartwell House, the seat of his old friend Dr. Lee, who purchased the instruments of the Bedford Observatory. Of course he had the run of the Hartwell Observatory, and he published, in a handsome quarto volume printed by Dr. Lee, an account of the mansion and its history. This was followed by another quarto, in which he published the record of his further observations down to 1859. He stuck to the double stars to the end of his life: last year he published a work on their relative colours.

Admiral Smyth had decided antiquarian taste. He collected a cabinet of Roman brass coins, of which he published an account in quarto. He also compiled an account of the Northumberland collection, which was printed in a handsome quarto by the Duke. He once turned this kind of research to curious account. Some of the "Bedford-born," as they called themselves, grumbled at strangers being allowed to share the Harpur endowment, on which the school is free to the children of residents. Capt. Smyth made a collection of the tradesmen's tokens, which in the sixteenth century supplied

the place of copper money. By the names he was able to show that the old stock had disappeared, and that those who would have appropriated the endowment were not the descendants of those who lived in the town when Sir Wm. Harpur's money founded the school. We may name one more little bit of research, the history of the Royal Society Club.

Admiral Smyth was for thirty years on the Council of the Astronomical Society, and took his turn as President. He was also an active Fellow of the Royal, Antiquarian, and other Societies.

It is difficult, so soon after his death, to attempt to paint the mixture of sense, kindness, and waggery which made Admiral Smyth a unique member of the scientific world. Neither are our readers concerned with the sterling good which placed him high as a member of society. To the last he retained a love of fun which made his friends tell him that he ought never to have been promoted out of the cockpit. He was always a midshipman, overlaid, indeed, by higher grades, and modified by age, but still with a fresh and boyish humour, which lighted up every company into which he came, and mixed in a most piquant manner with his details of old recollections and his handling of grave subjects of discussion. We think that if it were the question how his picture should be painted we could suggest a scene of his life which would symbolize at once the astronomer, the antiquary, and the wag. We should take him as he appeared at the top of Pompey's Pillar, making observations with the theodolite. The ascent was easily managed; a kite laid a string over the column, the string pulled up a rope, the rope a hawser, and shrouds were soon properly placed. The Admiral tells us that he chose this site of observation because he suspected that Eratosthenes had made the Pillar a mark for one end of his degree of the meridian. But we strongly suspect that Eratosthenes was, on this occasion, a cover for nautical frolic, and a wish to astonish the Pasha.

Admiral Smyth was employed, up to his latest hour of work, upon a nautical dictionary, which we are afraid is not very far advanced. As now becoming usual, an obituary account has been got up with more haste than good speed, as happened lately in the case of the Admiral's old colleague at the Astronomical Society, Mr. Benjamin Gompertz. We are informed that in 1857 Admiral Smyth succeeded Sir F. Beaufort as hydrographer to the Admiralty: on this point we suspend our opinion until we have consulted Capt. Richards about Capt. Washington. We are also told that he was more known for his connexion with science than for his naval services. Surely the Mediterranean survey was a great naval service. But what is meant is fighting: now lieutenants do not, except in very lucky cases, achieve renown which lasts for half a century. From before 1804 to 1815 the Admiral's life was nothing but service against the enemy: though such small matters as the command of a gun-boat at the siege of Cadiz are not fame in our day.

#### THE LAND OF GOSHEN.

September 11, 1865.

In the *Athenæum* of September 2, "A Suffolk Incumbent" suggests the advantage of examination, by scientific persons, of certain districts in Egypt and near the Red Sea. Apparently, the "Suffolk Incumbent" has not had access to a large quantity of existing accurate information, obtained by scientific men, and referring to the very districts of which he speaks. Much was obtained by travellers of the last and the beginning of the present century, but their explorations were not made without difficulty. More lately, however, the country has been examined very carefully and under very favourable circumstances, by Robinson, Russegger, and Stanley. The amount of scientific information collected by Russegger is very great, but he expressly disclaims the character of a "Bibl. Forscher." On the whole, the best information for the present purpose is that furnished by Robinson. From his work, "Biblical Researches in Palestine, Mount Sinai, and Arabia Petraea," with some notes from other sources, I will extract a few remarks

bearing on the questions introduced by the "Suffolk Incumbent."

1. I do not deny the possibility of a change in the altitude of the soil in the country usually adopted as the ancient Goshen; but there is no necessity for assuming it. The following are interrupted extracts from Robinson's notes.—"This tract is now comprehended in the modern province esh-Shurkiyeh..... That the land Goshen lay upon the waters of the Nile is apparent from the circumstance that the Israelites practised irrigation, that it was a land of seed, figs, &c..... Goshen probably extended further west and more into the Delta than has usually been supposed..... The immediate descendants of Jacob probably drove their flocks for pasture far up in the Wadys of the desert..... but in process of time they became also tillers of the soil..... The Land of Goshen was 'the best of the land,' and such, too, the province esh-Shurkiyeh has ever been, down to the present time. [Robinson refers to a document of 1876 to this effect, and proceeds]—During my stay in Cairo, I made many inquiries respecting this district, to which the uniform reply was, that it was considered as the best province in Egypt..... Lord Prudhoe ascertained that the province of the Shurkiyeh bears the highest valuation and yields the largest revenue." It is plain that no assumption of change of level is necessary.

2. The neck of land between the Red Sea and the Bitter Lakes has certainly been raised several feet within historic times. This was abundantly ascertained in the surveys introductory to the formation of the present canal. It is certain also that at one time (on the evidence of the marine shells) the Bitter Lakes have been filled with salt water, and that at another time (on the evidence of historians) they were filled with fresh water. On these points, I would refer the "Suffolk Incumbent" to a discussion which occupied a portion of several numbers of the *Athenæum* in 1850 and 1851, especially to the papers in the numbers of 1851, June 28 and July 5. The shells on the little rocks have probably been blown up by the wind.

3. The recovery of the name "Hirath" or "Hiyras" is perhaps valuable. The name for Pi-hahiroth in the Septuagint is τὸ στόρα Εἰρώθ, which seems to connect the Hebrew name with the modern name of the rocks.

4. The Suffolk Incumbent remarks, "Where the Bible says, Moses led the people away from the Red Sea, we turn short and go along the shore." Apparently an important statement in the Pentateuch has escaped notice. In Numbers xxx. 10, after passing Marah and Elim, they "encamped by the Red Sea." All geographical circumstances agree in fixing this encampment at a point of the coast immediately south of Jebel Hummaun; and, if this is accepted, it seems impossible that Sinai can be in any other place than that usually assigned to it.

5. The Suffolk Incumbent suggests that the country north-west of Akabah should be examined, and mentions the name (Torah or "Law") of a mountain which was seen on the journey between Petra and the Nukb-es-Sifah. Robinson took this route, but nothing particular was remarked on it. Robinson also took a route directly north-west of Akabah, through the very district Azazimah which (as I understand) is suggested for special examination; but nothing remarkable was noticed. This enterprising traveller approached or quitted Hebron by three different southerly routes, and could scarcely have failed to discover some indication of the Mountain of the Law had it been in the desert north of the Haj route.

6. The Amalekites were, I presume, a nomadic tribe, and I see no difficulty in their inhabiting, at one time, the southern part of the Sinaitic peninsula, and at another time the neighbourhood of the mountains of Judah.

7. I would now indicate a region which seems to have greater claims for examination. It seems that the Israelites were twice at Kadesh-barnea; once near the beginning of their wanderings and once near their termination. Kadesh-barnea is fixed, with very great probability, at Ain-el-Weibeh, in the Arabah. At their first residence, after their despair on the report of the spies, they were ordered

to go by the way of the Red Sea. It is unlikely that they went again to the terrible desert west of the Gulf of Akabah, and I conclude that they went into Arabia proper. At their second residence, when the Edomites refused them a passage to the east, they made (with great suffering) the circuit of the southern part of the land of Edom, and apparently fell into the Damascus Haj route, by which they went northwards till they came abreast of the country of the Amorites. I believe that the district east of the Gulf of Akabah, and the Damascus Haj route and the approach to it from the west, are very little known to European travellers, and I should be glad to have them carefully surveyed.

A. B. G.

#### THE GATE OF THE PACIFIC.

Garrison Club, Sept. 11, 1865.

I am unwilling to have any further discussion, either with the *Athenæum* or with the author of "The Gate of the Pacific," either on the merits of my own book on Panamá or on the merits of the Panamá Railway. As regards the book, I quite acknowledge that, as a rule, criticism should be left to the critics, and should not be criticized by the authors. As to the railway itself, I have expressed my opinion, and my opponent on the question has expressed his, and each opinion will be taken for what it is worth. But the author of "The Gate of the Pacific," in his letter to you of the 5th instant, goes much beyond the limits of fair controversy, and accuses me of an improper and dishonest motive, or rather he hints that which he does not dare to say openly. "Those," he says, "who know how the growth of our New Zealand and British Columbian colonies has been retarded, the expansion of our commerce in the Pacific prevented, our political prestige in those seas shaken to its foundation, and our means of postal communication and passenger traffic checked by the American monopoly of the Panama Railroad, will be surprised at Mr. Vice-Consul Bidwell's earnest advocacy of such a monopoly. But people must not judge harshly; who knows? there may have been weighty reasons for this American *pensant* on his part."

Such an insinuation as this cannot be regarded as fair criticism. The writer has intended to imply that I have been induced to give my testimony, not by evidence that has been conclusive to myself, but for some dishonest pecuniary consideration. I think, Sir, that you owe me the recompense of an apology for having lent your columns for the purpose of an accusation of this nature, as to which no little of evidence is produced or can be produced; and I think, also, that in publishing so vile a slander the author of "The Gate of the Pacific" has shown himself to be unfit for such controversy as gentlemen are satisfied to hold among themselves on mooted subjects of interest.

CHARLES T. BIDWELL.

\* \* \* We cannot allow this discussion, now become personal, to continue in our columns. Capt. Pim and Consul Bidwell are both gentlemen holding important public commissions; each had a right to be heard on the subject of Panama; they have been heard; and the public can now judge between them.

#### THE EISTEDDFOD.

Aberystwith, Sept. 12, 1865.

THAT great National Welsh Festival, the Eisteddfod, is held at this place, and has been formally opened this morning. Great preparations have been made for it, and huge placards have adorned walls and buildings down to the very sea-shore and far up into lead-mines and dreary hills. The town has been filling daily, and this morning vehicles of all descriptions rolled along the rough roads and into this old town.

A large boarded and felted roof pavilion was erected for the purpose of holding the meetings. Last night a kind of aqueous prelude, in the shape of a temperance meeting, drew together a multitude within the boards. One of the speakers was not so cool as his subject, and some dissension occurred by reason of a difference among the leading water-drinkers and the impatience of the singers to dispense the orators. The former wished to practise

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their singing for the morrow, and the latter were much disposed to keep the boards.

Prince Lucien Buonaparte was announced as the Chairman of the Eisteddfod, but did not appear, and, in fact, ought not to have been announced. A procession paraded the town and made its way to the castle about noon, where the mystic circle was formed. Certain very unattractive ceremonies were performed, and the bards of the former year were allowed to enter the circle. Therein they said a few words in Welsh, and one of them apostrophised the sun, who, however, was so uncomplimentary as to remain all the while behind a rain-cloud. The whole of the members and subscribers now returned to the pavilion; and thereupon the proceedings of the meeting commenced by an animated speech from the Vice-Chairman, who became Chairman in the absence of the Prince.

I will not inflict upon you the details of the whole lengthy meeting. The principal object was to announce the successful competitors for various prizes, and to summon them to the platform, whereupon they were severally invested with blue ribbons and presented with purses by fair ladies of name and family kindly disposed for this object. Nearly all the bards and musicians looked particularly uncomfortable when treading the platform, and only one or two had the grace to bend the knee while the ladies suspended the ribbons round their necks.

The best, and, indeed, the only noticeable part of the performance, was the musical. The choir sang well the airs in which they joined, and a little band of glee singers won a prize by singing a little song to the expressed satisfaction of the audience. A performance by three successive harpers on the Welsh harp was also well worth hearing, and the first of the three gained the prize, with the approbation of auditors as well as adjudicator.

It is to be hoped that the Eisteddfod will end as it has begun—well. But an unfortunate want of concert and previous preparation of details is apparent. One unhappy London gentleman was to preside over a social science meeting at nine o'clock this morning, in the Town Hall;—he was there, but the audience was not, and he remained almost alone in his glory.

It is announced that "the desirability of establishing a new Section in connexion with Geology will be discussed at one of the morning meetings." Certainly nothing can be more desirable, and it is only remarkable that so few good local geologists are to be found in traversing Wales. In such a town as this there ought to be the nucleus of a collection of rocks and fossils; without such a nucleus the taste for geology cannot be expected to spread amongst the people. I cannot find a geologist, or anything akin to one, in the town or vicinity. As upwards of 400l. is declared to be awarded in prizes, surely some 10l. or so might be given for the best essay on the geology of the district in which each Eisteddfod is held.

J. R. L.

## SIR RODERICK I. MURCHISON AT BIRMINGHAM.

Brookwood Park, Alresford, Sept. 9, 1865.

ACCORDING to the *Morning Post* of yesterday, Sir Roderick Murchison said, "I do not apprehend that those who have examined the tract of Coalbrook Dale will contend that the deep gorge in which the Severn there flows has been eaten out by the agency of the river, the more so when the deep fissure is at once accounted for when we see the abrupt severance that has taken place between the rocks which occupy its opposite sides;" and "when, indeed, we look at the lazy-flowing, mud-collecting Avon, which at Bath passes along that line of valley, how clearly do we see that it never scooped out its channel; still more when we follow it to Bristol, and observe it passing through the deep gorge of mountain limestone at Clifton, every one must be convinced that it never could have produced such an excavation. In fact, we know that from the earliest periods of history it has only accumulated mud, and has never worn away any portion of hard rock. From such data I conclude that we cannot apply to flat regions in which water has no abrading power, the same influence which it exerts in mountainous countries."

Now, the data are that Sir Roderick "apprehends" and "clearly sees" that a river cannot cut a gorge through limestone. But if Sir Roderick goes to the Falls of Niagara he will "apprehend" and "clearly see" that river can do this. Does Sir Roderick apprehend that the Niagara has not cut, and that it is not at this moment cutting the gorge below the fall? Does the "abrupt severance" of the "opposite sides" of the gorge prove it to be an igneous "fissure"? and is not the country through which the gorge is cut and the country above the gorge and below the gorge flat? Does not the river between Lake Erie and the falls flow (in Lyell's words) like "an arm of Lake Erie" over "a flat table-land"? Does not the same water which at the rapids and falls cuts the gorge through the solid rock, become in Sir Roderick's words "a lazy-flowing, mud-collecting river" between Queenstown (where it leaves the gorge) and Lake Ontario? How could it be otherwise? How could the river continue to fall over the hill after it has cut its channel through the hill and to the foot of the hill? When the further lowering of the bed of a valley is checked by the sea or a lake, or hard strata which cause a gorge or a shallow, denudation going on above produces a comparatively horizontal bed to the valley; this checks the flood-water descending from the comparatively steep upper valley, and the same flood-water which at first cut the valley down now deposits on it and fills the valley up. This is the origin of alluviums and deltas, on which gross ignorance prevails. The annual growth of (unembanked) alluviums and deltas in the flat part of valleys (which Sir Roderick adduces against aqueous denudation) is the very thing which proves that aqueous denudation is going on now. If not, how or from where does the deposit come? Can deposit take place without denudation? But these proofs of present denudation are not measures of it. As I have said, what is deposited on alluvial flats by the river is not a unit to a hundred thousand million of what flows out to sea from the present denudation of the atmosphere and rain. The foundation-stone of geology has yet to be laid. The first principle of geology is the law of stratification or deposit. But we have not perceived the cause of the first step towards this first principle. The first step to stratification or deposit is denudation. But geologists are ignorant of the cause of this first step, denudation, which (except the wear of coasts) is simply and solely from the atmosphere, and "rain and rivers." These throw the entire surface of the earth into ridge and furrow; every furrow or valley, whether dry or having a river, ending only at the sea. Hence, stratification in the sea. People who are no geologists or physical geographers think that there must be a descent to the centre of these furrows or valleys. Our two great geologists and physical geographers, Lyell and Murchison, do not think this is necessary. They call "the Wealden Heights" on the anticlinal "Forest Ridge," a valley to the centre of which (Crowborough Beacon) there is an ascent of 800 feet. Is it not time for a reform here?

GEORGE GREENWOOD, Colonel.

## OUR WEEKLY GOSSIP.

WE are glad to be able to announce that the Queen has permitted the International Horticultural Show and Congress, which is to be held next year, to be announced as under Her Majesty's patronage. Her Majesty has also contributed 50l. to the fund which is being raised for the purpose of carrying out the undertaking in a manner worthy of the country.

The amusing part of the Birmingham Meeting is over, and Prof. Phillips's year may be pronounced a great success. The banquets, outings and receptions are things of history. Uriconium and the Wrekin have been visited in the sunniest of summer weather,—and thanks to the explanations of Mr. Wright and the hospitalities of Mr. Wace, we shall not soon forget the Roman city. Warwick, Malvern, Coalbrookdale, have all established for themselves a pleasant hold in our grateful memories. Many admirable papers have been read, and for three or four weeks to come our columns will be busy with this important record. Mr. Grove is elected President for 1866, and Notting-

ham is selected as the place of meeting. Everything has gone well except the railway management. That has been execrable:—for example, on Saturday last the Great Western Railway threw some of our associates off the rails, injuring Lady Lubbock and Mr. Whymper, and bruising and wounding others; and on the same day, in another part of their wonderful line, they consumed three hours and three quarters in bringing home a small excursion party from Coalbrookdale to Birmingham, a distance of thirty-five miles! Many of the party were ladies, some of whom had come in from Leamington, Warwick, and the adjacent country houses, in the hope of getting home easily that night. When they arrived in Birmingham, the late trains had all gone; the hotels were full; and the weary travellers had to wait in coffee-rooms and elsewhere until the morning trains could take them home. It is satisfactory to know that the Meeting next year will not be held on the Great Western line.

At the concluding General Meeting, on Wednesday, the lists of grants were adopted, and the usual votes of thanks were unanimously carried. Some important modifications in the arrangement of Sections were submitted by the Committee of Recommendations and carried; namely, that the title of Section D, hitherto "Zoology and Botany," be henceforth changed to "Biology"; that Sub-Section D (Physiology) be suppressed, and that for the term "Sub-Section" the word "Department" be substituted. By this the incongruity of a major science, Physiology, being treated as a sub-section of its branches, Zoology and Botany, will be cancelled, and the whole group of related studies, including all that relates to the science of man, will be located in one grand section, the Council of which will be charged with the duties of procuring an additional departmental room for the reading of papers on such branches of the "science of Life" as may require extra or special accommodation, and of nominating from their own Council Vice-Presidents capable of presiding over each of such special branches. The Section D will thus include both Ethnology and Anthropology, while as Section E still retains Ethnology attached to it, the science of man will have a home in Section D, and a partial home also in Section E.—The numbers present at the Meeting were announced to be:—Old life members, 290; new life members, 44; old annual members, 216; new annual members, 148; associates, 767; ladies, 508; foreigners, 23; total, 1,996; and the amount received, 2,227.—The following grants of money for scientific purposes were made:—Kew Observatory, 600l. Mathematics and Physics: Mr. Glaisher, Lunar Committee, 100l.—Prof. Williamson, Electrical Standards, 100l.—Mr. Glaisher, Luminous Meteors, 50l.—Col. Sykes, Balloon Experiments, 100l.—Dr. Robinson, Sound under Water (renewed), 30l.—Mr. Glaisher, British Rainfall, 50l.—Mr. Airy, Reduction of Rümker's Observations, 150l. Chemistry: Mr. Fairley, Polycyanides of Organic Radicles, 20l.—Dr. Matthiessen, Cast Iron (renewed), 50l. Geology: Sir C. Lyell, Kent's Hole Investigation, 200l.—Mr. Mitchell, Alum Bay Fossil Leaf-Bed, 20l.—Dr. E. P. Wright, Kilkenny Coal Field, 20l.—Prof. Busk, Maltese Caverns Explorations, 30l.—Sir R. Murchison, Palestine Explorations, 100l.—Mr. J. W. Salter, Lingula Flags at St. David's, 20l.—Mr. J. Bryce, Researches on Earthquakes in Scotland, 25l. Zoology, Botany, and Physiology: Dr. E. P. Wright, Irish Annelida, 15l.—Mr. Newton, Didine Birds of Mascaren Islands, 50l.—Mr. Jeffreys, Hebrides Coast Dredging, 50l.—Mr. Jeffreys, Marine Fauna and Flora (Devon and Cornwall), 25l.—Mr. Jeffreys, Aberdeen and Banffshire Coast Dredging, 25l.—Mr. Scott, Oyster Culture, 10l.—Mr. J. G. Jeffreys, Mersey Dredging, 5l.—Dr. J. E. Gray, Oyster Culture, 25l.—Sir J. Lubbock, Bart., Typical Crania (renewed), 50l.—Dr. R. Norris, Observations on Rigor Mortis, 10l.—Dr. B. W. Richardson, Amyl Compounds, 25l.—Dr. B. Davis, British Crania, 50l. Statistics and Economic Science: Sir J. Bowring, Metrical Committee, 50l. Mechanics: Mr. T. Webster, Patent Law (renewed), 30l.—Mr. Scott Russell, Resistance of Water to Floating Bodies, 50l.

Mr. Gerald Massey has a new work just ready for the press, entitled 'Shakspeare's Sonnets never before Interpreted : with a Re-touched Portrait of the Man Shakspeare.' It contains a new theory of the Sonnets, the first brief hints of which appeared in the *Quarterly Review* for April, 1864. According to Mr. Massey's reading, the greater portion of the Sonnets, personal or dramatic, was written for the Earl of Southampton ; the rest for William Herbert ; and the story of Shakespeare keeping a mistress, of whom he was robbed by his friend, vanishes into thin air.

Mr. S. P. Day is preparing for the press a work called 'Woman and Civilization.'

The grave has now closed over the last of a poet's household. The widow of Moore rests by her husband's side. The voice of song had long been silenced in the little bower at Sloper-ton, where she who once listened lived on the memories of the old sweet echoes :

In future hours, some bard will say  
Of her who heard and him who sang the lay,  
They are gone ! They both are gone !

The papers which have announced the death of Mrs. Moore, early last week, have agreed in misstating her age, which they set down at sixty-eight. As she married Moore in 1811, this would imply that she was only fourteen when she married the bard, who was then in his thirty-third year ! The difference between their ages was by no means so great. Another, and a graver mistake, is the repetition of the malignant assertion of "the Right Hon. John Wilson Croker," made by him almost before Moore was buried, that the poet was a husband who cared little for his wife ! This assertion gave great pain to Mrs. Moore, and was resented by Lord John Russell. The "Right Hon. John Wilson Croker," however, only aggravated his unmanly offence by sneering at Moore's widow as "Lord John's interesting victim." All this malignity was the fruit of well-earned wrath, which was excited by the fact that fifty years before Moore had omitted to name Mr. Croker in the notes to *Anacreon*. Setting aside the terrible affliction of the loss of all their children, the home of Tom Moore and Bessy was a happy one. Because his journal only records his fittings abroad, and barely alludes to his home except in notice of some labour there, and thankfulness that he had leisure to perform it ;—because he sang lightly of

Brilliant short pleasure that flashes and dies,—

men are apt to forget that the poet was a solid scholar, and that his knowledge of patristic literature was more real than his acquaintance with Fanny of Timmol. It has also been said that Moore seldom or never alludes to his wife in his poetry. He was not publicly uxorious, but all his allusions are in exquisite taste, and a hundred passages in his diary are testimonies to the worth of his admirable wife, and to the high estimation in which he held her. "Then come," he says, in his metrical invitation to Lord Lansdowne to dine at Sloper-ton,—

Then come—if a board so contemptuous hath power  
To win thee from grandeur, its best shall be thine :  
And there's one, long the light of the bard's happy bower,  
Who, smiling, will blend her bright welcome with mine.

It is proposed to purchase by subscription and to preserve, as a memorial of Chaucer, the Talbot Inn, in the Borough High Street. The testimony of admiration thus proposed would be so far imperfect that it would be hard to prove any portion of the structure in question to be so old as the time of Chaucer.

It will be obvious to many that the longitudinal and transverse diameters of Dante's head, as given by the Commissioners, in their Report, were taken on the surface of the cranium. In the measurement of a skull in this way, a transverse line passing from the bony part of the external auditory passage on one side, to the corresponding point on the other, will usually be found a trifle longer than the occipito-frontal line. It would have been better, however, if the Commissioners had called these lines curves instead of diameters.

The Annual General Meeting of the Ray Society was held in Birmingham, on Friday, Sept. 8, in the Meeting Room of Section D of the British

Association. Prof. Tennant had been announced to take the chair, but was unavoidably detained in the Geological Section, and J. Gwyn Jeffreys, Esq. presided. The Report of the Council having been read, Dr. Lee moved and the Rev. A. Merle Norman seconded, that it be adopted and circulated amongst the Members. Dr. E. Hamilton, Dr. Hooker, Prof. Huxley and John Millar, Esq. were then elected Members of Council, in the room of four gentlemen retiring. Sir Philip de M. Grey Egerton, Bart., M.P., was re-elected *President*; Sir John Lubbock, Bart. was re-elected *Treasurer*; and H. T. Stanton, Esq. was re-elected *Secretary*, for the year ensuing.

The Polygraphic Hall has become the scene of a new entertainment, entitled 'Mrs. M'Gregor's Levee.' A newly-married lady, north of the Tweed, in the enforced absence of her husband, amuses herself by inviting to her residence certain national eccentricities, and is accordingly visited by the village innkeeper, the village scandalmonger, a whisky-loving female, a daft lad with an enormous appetite, a ballad singer, a Newhaven fishwife, and a deaf nurse. All these *rôles* are cleverly supported by Mr. Gourlay, a Scotch actor of considerable merit in national character parts, and will probably amuse no inconsiderable portion of the public.

A belief is sometimes expressed that nowadays people marry later in life than they did formerly; but if this is the case in certain classes of society, it does not obtain among the people generally, for the proportion of young persons who marry has never been so high as during the year 1863, and, with very few exceptions, the rate has been annually increasing during the last 20 years. In 1841, in every 100 marriages, 4·88 of the men, and 13·29 of the women, were under 21 years of age. In 1861 these proportions had risen to 6·61 and 19·90 respectively. The counties in which the greatest proportion of young persons married are those of Buckingham, Northampton, Huntingdon, Bedford, Cambridge, Stafford, Leicestershire, York, West Riding, and Durham. The counties showing the smallest proportions are Middlesex (extra-metropolitan), Hereford, Salop, Rutland, York (North Riding), Northumberland, and North Wales. 132,248 men and 116,094 women wrote their names at marriage ; 41,262 men, and 57,461 women signed with marks ; 76 in a hundred men wrote their names and 24 made marks. In 100 women, 77 wrote their names and 33 made marks. These proportions are precisely the same as in the previous years, and cannot be regarded as satisfactory; the 12 preceding years show a continuous decrease in the per-cent of those who signed with marks. London heads the list with proportions of 89 in 100 men, and 82 in 100 females signing their names. In Monmouthshire and Wales the state of education estimated by this standard is very defective. Half the women who married in Wales and Lancashire signed with marks. England is as healthy as Scotland, which affords an average space of six acres to a person, while in England the area is less than two acres.

On Tuesday there was a pleasant spectacle at the Crystal Palace. Three steamers and a special train brought over 1,400 excursionists from Calais, many of whom went into London as well as into the Palace. This was done at a charge of 4s. each ! These visitors from Picardy, of all ages and various grades, appeared to thoroughly enjoy themselves ; especially half-a-dozen *matelettes*, whose frank gaiety delighted everybody. The excursionists were accompanied by the band of the fire brigade of St. Pierre, consisting of 80 men in handsome uniforms. All these are mechanics ; the leader is a respectable tradesman, and their performances were highly relished by a very large audience. By six o'clock all were assembled at the station for the return trip, though there were one or two loiterers over *Buss*, who narrowly escaped being too late.

One of the most remarkable features of the day was the presence, from twelve to half-past four, of the Prince and Princess of Wales, and the Prince and Princess Louis of Hesse. As a sample of how contemporary history is written, we may allude to one newspaper report, which states that the royal visitors owed their not

being mobbed to the fact that the majority of persons present were foreigners. The total of visitors was nearly 6,000, of whom a fourth may have been foreign. By neither foreign nor native element were the royal visitors in any way impeded.

To mark the recent retirement of Dr. Corrigan from the Presidency of the King and Queen's College, Dublin, to which office that gentleman had for several successive years been re-elected, a marble statue and a portrait in oils are to be placed in the Hall of that Institution. The portrait is by Mr. Catterson Smith, President of the Royal Hibernian Academy, and now in the Dublin International Exhibition. The commission for the statue is placed in the hands of Mr. Foley, R.A., who is also engaged on a similar work of Sir Henry March, M.D., for the same Institution.

The graceful compliment which we paid to the French people in erecting a monument to Lieut. Belot, in the front of Greenwich Hospital, our neighbours have returned to us by erecting a monument to Dr. Jenner at Boulogne, which, with appropriate ceremony, has just been uncovered. May such courtesies continue between us for ever !

The friend of Mr. Oliver asks us to publish the following details and corrections :—"In the *Athenæum* of last Saturday you inserted a quotation from my letter of the 6th instant, in which quotation there is this statement : 'And he was positively driven out of the Roman States by a sort of vengeance got up against him.' As it is very necessary I should be extremely exact in what I communicate to you on this subject, and not compromise the young artist in any way, I must beg you to explain in your next number that the above statement was not one of fact, made by the 'young artist' to me, but was a deduction drawn by me from the whole circumstances of the case, including, of course, the capture under discussion. I may state, in continuation of the facts, that after arriving in Florence, Mr. Oliver showed his wounds to the Secretary of the British Legation, as well as to Count Usedom, the Prussian Ambassador (*not* 'author'), and that the wounds were still on his person, as I can vouch from demonstration."

MR. MORBY'S COLLECTION OF MODERN HIGH-CLASS PICTURES IS ON VIEW at the Royal Exchange Fine Arts Gallery, 24, Cornhill. This Collection contains examples of J. Lewis, R.A.—Hock, R.A.—Philip, R.A.—Fritsch, R.A.—Roberts, R.A.—Poole, R.A.—Goodall, R.A.—Cooke, R.A.—Cope, R.A.—Creswick, R.A.—Pickersgill, R.A.—Leighton, R.A.—Calderon, R.A.—Saint, A.R.A.—Wright, A.R.A.—Marsden, R.A.—see Le Jeune, A.R.A.—Dobson, R.A.—Cooper, R.A.—Gale—Galaté—Frère—Duverger—Auguste Boëher—Marks—Pettie—F. Hardy, &c.—Admission on presentation of address card.

ROYAL POLYTECHNIC.—Patron, H.R.H. the Prince of Wales.—The Marvellous Birds, Mdlle. Emilie Van der Meerch from Paris, every Morning and Evening, at 2·30 and 8·30.—Wonderful Proteus, and Professor Pepper with Burton's Meccos and Medina, at 2·30 and 7·30.—Musical Entertainment, at 4 and 8—King's Lectures.—Railway Models, and other Entertainments.—Admission, One Shilling. Open 12 to 5, and 7 to 10.

## SCIENCE

### BRITISH ASSOCIATION.

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### THURSDAY.

The PRESIDENT said :—"The Lunar Committee have been engaged during the past year, and will state the results of their labours in their Report. The planet Mars has been the object of much telescopic research on the part of our President, Messrs. Dawes, Lockyer, and others. The supposition that the redder parts of its disc are land, and the greyer parts sea, appears to be established. Recent observations also confirm the view that snow is visible in its polar regions. Comparing the

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latitudes of arctic climate on Mars with those on the earth, it has been concluded that the temperature on the two planets is not very different. The solar radiation in the two cases is of course very disproportionate; but the explanation of the result is to be sought in the action of a dense atmosphere, which, as Prof. Tyndall has shown, serves to retain large quantities of heat which would otherwise radiate off into space. The minor planets continue to increase in number, and in addition to the amount of attention which they usually receive, they have been the subject of an important paper by M. Serret, who has brought out the first part of a complete theory of Pallas. He states that, in a second part, which has not yet appeared, he has arrived at some curious and unexpected results. Mr. Lassells has given an ephemeris of the satellites of Uranus (now reduced to four). Luminous meteors and shooting stars have now in a great measure been brought within the range of law and observation. The labours of Alexander Herschel and others have shown that not only the periodic showers of August and November may be classed with planetary phenomena, but that even the movements of other meteors may be regulated by similar laws. A member of the French Academy has even gone so far as to suggest that the known depression of temperature in February and May, and its elevation in November, may be accounted for by the position of these clusters of bodies alternately intercepting the solar rays or screening them from radiation into space. In the mean time, the Committee on Luminous Meteors continues its labours in registering all well-authenticated observations of meteors of a more casual appearance. Its register will, it may be hoped, some day prove a valuable repertory for comparison. In an elaborate memoir presented to the Astronomical Society, M. Hoech argues that the orbits of comets generally are not elliptic, but either parabolic or hyperbolic; that these bodies do not in any way belong to the solar system, but that they pass near us in their course through space; and that the configuration of their perihelia and the inclination of their orbits indicate that they lie in groups, fragments of larger bodies. Passing to the more distant regions of space, the nebulae have been carefully observed, and their spectra analyzed by Mr. Huggins and others. This analysis appears now to confirm the surmise that many of the unresolved nebulae are in fact actually gaseous. In one curious instance, that of the great nebula in the sword-hilt of Orion, telescopic and spectral observations appeared to be at variance. The former showed the nebula to be resolvable partially at least into a few bright spots; the latter showed a spectrum of only three bright lines, a criterion of gaseosity. The solution of the contradiction is doubtless to be found in the suggestion that the bright spots are not stars, but aggregations of the gaseous fluid. Imagination would lead us to conclude that we have here a cosmic process actually in operation before our eyes, the birth of a stellar group, the formation perhaps of solar systems, the nebular theory realized in fact; but strict scientific induction forbids us as yet to receive this as an ascertained conclusion. While dwelling upon these large speculations, we must not omit to mention that M. Gassiot, to whom so much is due in spectral as well as electrical experiment, is aiding research into minute points by actually constructing an apparatus the object of which is to examine whether the so-called fixed lines in the solar spectrum undergo any change of position by the alteration of gravity due to a change of latitude in the station of observation. Returning from these distant regions to our own planet, and at the same time to a subject which has special connexion with this Association, terrestrial magnetism is continually receiving additions, in the steady accumulation of reliable records from the Kew Observatory, from the establishment and improvement of observatories in foreign countries, and last, but not least, from the co-ordination and reduction of our own colonial observations at the hands of the patriarch of the subject, General Sabine. If, as we hope, nothing should interfere with the progress of his labours, it is probable that, in the course of two years, data deduced from stations properly distri-

buted over the surface of the globe, and sufficiently well supported, will be before the scientific world, such as to justify a recomputation of the Gaussian constants. Those only who have made themselves acquainted with Gauss's classical memoir on the subject can form an idea of the grandeur of the questions with which a competent knowledge of these constants and their variations will enable the mathematician to grapple. The University of Cambridge, with a laudable attention to the progress of this science, proposed it as the subject of the Adams prize of this year; a proposition which has been worthily responded to. The Stonyhurst observations are likewise carried on with the usual assiduity and care. Passing from the larger operations of nature to the more minute experiments of man in this or kindred subjects, we have a novel and apparently successful simplification from France in dispensing with the covering for the wire coils in electro-magnets; a suggestion for the use of sulphur instead of glass plates in electrical machines; and others on which papers will probably be submitted to the Section. The indefatigable Committee on Standards of Electrical Resistance have prepared a further Report, which will be read before you. The gigantic experiment to which this question has recently been submitted will doubtless give an additional interest to the subject on the present occasion, and we shall hope for some discussion upon that which, in spite of its present interruption, I do not hesitate to call a great scientific success."

'Report of the Electrical Standards Committee, by Mr. FLEEMING JENKIN.

'Report on Luminous Meteors,' by Mr. JAMES GLAISHER.—The principal points in this valuable Report were as follows: The number of meteors observed during the past year had been unusually small, partly owing to the cloudy state of the sky, and partly owing to the absence this year of certain acknowledged star-showers, namely, those of January, April, and August. The November shower, although concealed in England by clouds, was observed with considerable interest at Malta. If the sky be clear, the circumstances are altogether favourable for its re-appearance, in the present year and the next, on the mornings of the 13th of November. Its greatest display is expected in 1866, but in the present year it is desirable to be prepared for its appearance. The British Association having printed maps for the use of the Committee (specimens of which were presented with the Report), every means will be provided to members willing to take part in the observations of this shower to enable them to record their observations with facility. A remarkable shower of meteors was observed on the 18th of October, coinciding with a date on which fire-balls have made their appearance in more than average numbers. The radiant-point of this shower is perfectly well defined in Orion. There was a less conspicuous star-shower on the 28th of July, with a radiant apparently distinct close to Fomalhaut, the most southerly star observed on our meridian. A number of other accurate observations of star-showers are included in the Report. Of large meteors, the greater number took place in December. Two detonating meteors were also observed: the first in England, on the 20th of November; the second in Scotland, on the 21st of February. Observations show that, on the first of these nights, shooting stars were extremely scarce, so that, at Weston-super-Mare and Hawkurst, only one or two meteors could be counted in an hour. This fact illustrates, in a remarkable manner, the adventitious character of large meteors. A third detonating meteor, on the 30th of April, was doubly observed, at Manchester and Weston-super-Mare, and its height well determined. The nearest approach to the earth was thirty-seven miles. Startling as are the accounts of detonations heard from such a height, it is yet more surprising that the report from such a distance should be brief and momentary. The sounds caused by meteors yet offer much which it is hoped will be explained by further observations. Interesting matter is given in the Report by Mr. Brayley and Mr. Sorby, 'On the Origin of Meteorites, and on the Series of Physical Processes of which they are the Result.' It appears, from microscopic examinations of their structure,

that aerolites resemble, in their appearance, certain igneous terrestrial rocks; but characteristic peculiarities in their structure evince that this is far from being a complete account of their previous history. Mr. Brayley suggests that they originate in gaseous matter projected from the equator of the sun, and condensed to a solid form in its passage through interplanetary space. A gradual condensation from the vaporous state is said, by Mr. Sorby, to represent more nearly than any other the condition under which they must have been consolidated. In this view of the origin of meteorites, their source is considered to be unique, and they are traced to the energetic forces whose modes of action are considered in solar physics. The bodies thus arising are termed "meteoritic masses," to distinguish them emphatically from all other members of the solar system. In a 'Memoir on Sporadic Shooting Stars,' Mr. Newton, basing his conclusions upon a previous knowledge of their height, arrives at some interesting results regarding the number and distribution of these bodies in space. The average height of the centres of their visible tracks is sixty miles above the earth. Their number in the atmosphere daily is seven and a half millions, and if not intercepted in their flight, there would be found in the space occupied by the earth at any instant in its orbit, 13,000 of such bodies pursuing different orbits. Of shooting stars visible in telescopes, Mr. Newton calculates that the number is at least fifty times greater than the number of those visible to the naked eye. Indeed, there appears to be no limit to their minuteness nor to their numbers. Their velocity is greater than that of the earth in its orbit, and Mr. Newton supposes they are grouped together according to some law, probably that of rings encompassing the sun, resembling, in their inclinations and dimensions, the orbits of the comets. Mr. Newton, in conclusion, supposes that these bodies, which he terms meteorites, are not fragments of a former world, but rather materials from which new worlds are forming. Meteorites and meteoritic masses, then, constitute two classes of bodies which have to be considered in meteoric astronomy. It is, however, reasonable to presume that the same forces which, in the phase of greatest concentration of the solar system, give rise to *meteoritic masses*, might, in a phase of vastly greater antiquity and of greater extension of the solar orb, have given rise in a similar manner to rings of *meteoroids*. Continued observations directed to the phenomena of shooting stars will certainly remove doubt from this province of astronomy, and probably throw light on some of the most difficult questions in cosmical philosophy, such, for example, as the existence of organic matter (a kind of peat or humus) in the meteorites of Orgueil. From the great bulk of recorded observations still further embodied in this voluminous document, we may further notice a subject of high interest, the possible influence of some of these larger streams of meteorites in producing singular periodic anomalies in our terrestrial atmospheric temperature. Brandes, at the beginning of the present century, first pointed out the occurrence of a hesitation in the curve of temperature of the air about the 12th of February. Mädler, in 1834, drew attention to a similar depression of temperature about the 12th of May. Erman, in 1840, ascribed these cold days of the year to the obscuration of the sun by the passage of meteorites across its disc. At the opposite extremities of their orbits one ring of these meteorites furnishes us with the meteors of August, another passes us in November. At these latter periods M. Petit has shown that the temperature of the air undergoes a small but appreciable elevation. In support of Ernaud's theory M. Deville produces the mean temperature at Paris for fifty-seven years of the cold and warm days in question, from 1806 to 1863. M. Faye remarks upon this mode of accounting for the anomalies in the temperature of the air, that this theory must be received with caution. Mr. Glaisher, on the present occasion, exhibited a diagram, showing the adopted mean temperature of every day in the year as determined from the thermometrical observations at the Greenwich Observatory in fifty years from 1814 to 1863, which showed that a great break in the continuance of the tem-

perature-curve, perhaps the most remarkable of any in the year, taken place at the end of November, causing a maximum of temperature on the 3rd of December, which cannot be explained by any regular appearance of meteors at that date. The Committee requested, in conclusion, a renewed grant to enable them to continue these Reports, and to add to the set of maps now printed, the leading tracks of nearly 2,000 meteors contained in the catalogues of the British Association, Dr. Heis and M. Coulviers Gravier, by which the character and position of fifty-six radiant points of shooting stars have already been ascertained and well defined by Mr. Greg.

"On the Second Law of Thermodynamics,"<sup>4</sup> by Mr. W. J. MACQUORN-RANKINE.—It has long been established that all the known relations between heat and mechanical energy are summed up in two laws, called respectively the first law and the second law of Thermodynamics, viz.:—First Law: Quantities of heat and of mechanical energy are convertible, at the rate very nearly of 772 foot-pounds to the British unit, or 424 kilogrammetres to the French unit of heat. Second Law: The quantity of energy which is converted from one of those forms to the other during a given change of dimensions and condition in a given body, is the product of the absolute temperature into a function of that change, and of the kind and arrangement of the matter of the body. By *absolute temperature* is here to be understood temperature measured according to a scale so graduated that the temperature of a homogeneous body shall vary in the simple proportion of the quantity of energy it possesses in the form of sensible or thermometric heat. The laws of thermodynamics as here stated are simply the condensed expression of the facts of experiment. But they are also capable of being viewed as the consequences of the supposition that the condition of bodies which accompanies the phenomena of sensible heat consists in some kind of motion amongst their particles. The first law would obviously follow from the supposition of any kind of molecular motion whatsoever, and it therefore affords of itself no reason for preferring one supposition as to the kind of molecular motion which constitutes sensible heat to another. But if there be molecular motions in bodies it is certain that, although all of them are capable of conversion into that which constitutes sensible heat, some of them are not accompanied by sensible heat. For example, the motion, supposed to be vibratory and wave-like, which constitutes radiance, whether visible or invisible, is not accompanied by sensible heat, and only produces sensible heat by its absorption, that is, in the language of hypothesis, by its conversion into some other kind of motion; while on the other hand in the production of radiance sensible heat disappears. The object of the paper, then, was to give an elementary proof of the proposition that the second law of dynamics follows from the supposition that sensible heat consists in any kind of steady molecular motion within limited spaces. Steady motion may be defined as motion in a set of streams of invariable figure. When steady motion takes place in matter that is confined within a limited space, the streams in which the particles move must necessarily return into themselves, and be circulating streams, being, in that respect, of the nature of whirls or vortices. Steady motion keeps unaltered the distribution of the density of the moving matter; and it therefore keeps unaltered the forces depending on such distribution, whether of the nature of pressure or of attraction. In this respect it differs from unsteady motion, such as vibratory and wave-like motion. Supposing that the dimensions of the limited space, in which the moving matter is inclosed, undergo an indefinitely small change by the application of suitable forces, and that after that process the motion becomes steady, as it was before, then the dimensions and position of each circulating stream will have been altered, and the work done in effecting that alteration will consist of energy converted between the forms of potential energy of the applied forces and the actual energy of the molecular motions that is between the forms of mechanical energy

and heat. Prof. Rankine then works out the problem to this conclusion, that if sensible heat consists in any kind of steady molecular motion within limited spaces, the conversion of energy during any change in the dimensions of such spaces is the product of the absolute temperature into some function of that change, and of the sort and distribution of the matter. It is obvious that the *steadiness* of the supposed molecular motion is the essential condition which makes the second law of thermodynamics deducible from a mechanical hypothesis, and that no kind of unsteady motion, such as vibratory or wave-like motion, would lead to the same results. If then it be admitted as probable that the phenomena of heat are due to unseen molecular motions, it must also be admitted that, while the motions which constitute radiance are vibratory and wave-like, the motions which constitute sensible or thermometric heat must be steady, and like those of circulating streams. The function by which the absolute temperature is multiplied in calculating the conversion of energy between the mechanical and the thermic forms is the variation of what the author has called the "metamorphic function," being one term of the differential of the "thermodynamic function," and corresponds to what Prof. Clausius calls "entropy."

On a New Method, introduced by Messrs. Siemens, for the Measurement of Electrical Resistances,' by Mr. R. SABINE.—The insulation of submarine telegraph cables was, until the Red Sea and Indian lines were submerged, in 1859, determined qualitatively by the simple deflection of a galvanometer needle. The manufacture of the core of the Malta cable, with the scrupulous surveillance of its electrical conditions, forms an era in cable-work; and Messrs. Siemens, who were intrusted by the Government with the duties of electricians to the cable, may be said to have then first established with success the science of cable testing. After various improved plans, the Messrs. Siemens introduced, in 1860, for cable-work, a differential galvanometer with two coils, one of which exerted two thousand times more defective force upon the needle than the other. The cable and the measuring battery were inserted in the circuit of the larger helix, and a single element with a set of resistance coils in that of the less sensitive helix of the instrument. The resistance in the latter circuit was altered until the magnetic forces of the two currents upon the needle were equal and opposite and the pointer rested over the zero line of the card. The manipulation was simple, and the necessary calculations reduced to the mere multiplication of the value of the resistance in the smaller circuit with the constant of sensibility and the relation of the electro-motive forces. On the fitting out of the Cartagena cable it was considered desirable in measurements of insulation to dispense with mathematical reductions and to read off the resistances directly from the instrument. It is easily understood that, to establish an equilibrium between the magnetic forces of two coils of a differential galvanometer, it is not absolutely necessary to alter the currents in either of the circuits; the same may be attained by altering the relative distances of the coils from the needle. This is the principle upon which the new differential galvanometer, forming the subject of this communication, was based. The mechanical construction of the instrument is very simple: a pair of astatic needles are suspended by a fibre of unspun silk between about 10,000 turns of a long, thin, well-insulated copper wire; their position being indicated by an aluminium pointer fixed across their axis, moving over a dial card and observed through a magnifying-glass. Outside the case of the instrument is a horizontal metal stage, upon which a vertical coil of insulated copper wire is moved to and from the instrument by means of a micrometer screw. The theory of the method of this instrument and its use in testing cable resistances, is this:—Two galvanic currents circulate in the two coils—the stationary and the movable—in opposite directions; and will oppose each other in their effects upon the needle, which will take up a position at an angle less than that which it would if the stronger coil were alone active. By altering the

position of one of the coils a point is reached where the deflective force of one coil is made to exactly counterbalance the force of the other, and the needle returns to zero. To measure the resistance of a cable with this instrument, then, nothing more is necessary than to put it in the circuit of the larger coil and to vary, by means of the micrometer screw, the position of the movable coil until equilibrium is obtained. The distance is then read off, and a table prepared beforehand supplies the corresponding resistance in units. In this way, during the paying out of a cable, the state of the line can at any time be known without expending time in calculating the observations.

'On India-Rubber considered in reference to its Applicability as an Insulator for Telegraphic Conductors,' by Mr. W. HOOPER.—Native or raw india-rubber, when in good condition, may be kept for years without sustaining any deterioration; but in certain stages of its manufacture it becomes susceptible of decay. This decay is well known to be the result of oxidation, and is characterized by a gradual tendency to fluidity. The process by which it is rendered suitable for the purposes of insulation involves its partial oxidation; and unless that oxidation is arrested, the rubber becomes useless as a permanent insulator. Being thoroughly washed and dried, it is masticated, by which means it becomes highly coloured, and is afterwards found to contain a variable amount of its oxidized product. By this process it has been converted into solid masses or blocks, which are first cut into sheets, and these again subdivided into tapes. The tapes being put on the wires, an operation is required to reduce them into a perfectly uniform and solid covering. This has been usually effected either by the use of solvents or the direct application of heat, both of which plans are seriously objectionable: in the former case, the india-rubber becoming more susceptible of oxidation, whilst the latter method induces a molecular change favourable to the same action. Wires insulated by either of these means indicate a very high state of insulation when first made, but as the india-rubber decays the insulation is reduced, and ultimately destroyed. The author has invented a process, not described in the paper, by which, he states, to a great extent, if not entirely, these defects have been overcome; and of five samples of submarine wire supplied to Government about two years ago, and laid in the Persian Gulf, the one manufactured by him has been reported on as the only one remaining perfect. It is said to be subject to a temperature of 75° Fahr., and to be three times better than the gutta-percha insulated wires which form the core of the Persian Gulf cable. The author stated this to be the highest degree of insulation yet practically attained; and further, that the effectual manner of closing joints by his process both with old and new materials was such as entirely to remove apprehension on that important point. Ten miles of his insulated wire, containing in each length from eight to twelve joints, had been subjected to temperatures of 75° and 95° Fahr. respectively, for 240 hours, and on being reduced to the initial temperature were found to have suffered no permanent change. The capacity the process further afforded of closing minute faults, and the resistance of the material to mechanical injury, were points of importance in respect to its adoption for submarine cables. As one great advantage of this insulator, it is asserted that its inductive quality being lower than gutta-percha, retardation is diminished; and therefore, taking the inductive capacities of gutta-percha and the insulating material described in this paper at stated by Prof. W. Thomson, Sir C. Bright and Mr. Clark, 136 messages should be transmissible by Mr. Hooper's india-rubber, as against 100 by gutta-percha-covered wire.

**Mr. FLEEMING JENKIN** spoke in favour of the permanence of the material prepared by Mr. Hooper's process.

'On Moving Photographic Figures, illustrating some Phenomena of Vision connected with the Combinations of the Stereoscope and the Phenakistiscope, by means of Photography,' by Mr. A. CLAUDET.—From the beginning of photography it must have struck those who were acquainted with the phenakistiscope, invented by Plateau, that

photography could produce with advantage series of pictures for that instrument with greater accuracy than any made by hand. When, at a later period, the stereoscope had become popular, there was a still stronger incitement for desiring to make use of that process to produce binocular pictures for the phenakistiscope in a way to combine the stereoscopic effect with the illusion of moving figures. M. Duboscq made some ingenious attempts in this direction: however, not perfect; for in his revolving disc the two series of pictures do not move with the same velocity on account of their being placed on two zones of different peripheries, which produces a sort of confusion and distortion in the representation of the object during its movement. In his revolving cylinder this defect does not take place; but the pictures being curved like the cylinder is a most unfavourable disposition for examining them in the stereoscope. About the same time, the author had also turned his attention towards the subject, and had practically experienced the difficulty of obtaining together the phenakistoscopic and stereoscopic effects without similar defects. He desired to lay before the Association an attempt he had made some years ago, but not being perfected had so far been shown only to his own intimate scientific friends. An instrument was first exhibited to show how easy it was to obtain the illusion of moving figures without stereoscopic effect; two pictures being sufficient to elicit the phenomenon, although the illusion of reality suffers from the abruptness of two extreme movements and from the deficiency of intermediate positions. Nothing, however, is easier than to employ eight different pictures in as many different stages of the action; and with this number the effect will be sufficiently complete. For this, Mr. Claudet, having placed in his stereoscope two separate cubic frames, has only to fix on their four sides, at right angles, two sets of four pictures, making eight pictures, which are made to pass in consecutive order before the lenses, and the figure assumes consecutively eight different stages of the whole action. The instrument in its simple state, with only two pictures, will suffice to illustrate the principle, and, at the same time, elicit some curious phenomena of the perception of vision.

It is well known that the retina has the power of retaining, for a short time, the impression or the sensation of the image which has struck it. Availing himself of this property, the author has constructed an instrument in such a manner, that by means of a slide, with one hole, he can, by moving it rapidly in a reciprocating horizontal direction, shut one lens while the other remains open; and in continuing that motion, while one eye sees one of the two pictures, the second eye cannot see the other picture. If, before the sensation of one eye is exhausted, the slide shuts the first lens and opens the other, a new impression is produced on the retina, and we have an interrupted sensation of vision as if the object had moved before us; and if a sufficient number of pictures represent that object in the various consecutive positions it has assumed during several stages of its motion, we experience on the retina the same sensations we have when we see the object itself while it is moving; and although the pictures in their limited number do not and cannot show all the intermediate positions of all the stages of a continuing action, still the mind has the power of filling up the deficiency as it does, if when looking at a real object in motion we accidentally wink the eyelids, or an obstacle happens to pass between us and the object. To exemplify this, Mr. Claudet has constructed two pictures, one representing the beginning of an action, the other the end. By moving the slide one way, the right eye can see the picture representing the figure in one position, while the picture showing the other is invisible to the left eye; then by moving the slide the other way, the left eye sees the figure in the second position, and the first picture is invisible to the right eye. Although we have really only seen the figure in two extreme positions, still we have had the illusion of having observed the intermediate positions—as, for example, in a slide exhibited having one picture of a boxer with his arm close to his side as preparing to hit, and another with the arm extended delivering the blow. Here, although all the intermediate positions are

omitted which must have been assumed during the act, the mind completes the action. Another curious phenomenon of this alternate vision is, that one cannot distinguish which eye the object is seen by.

'On a New Form of Spectrum-Microscope,' by Mr. H. C. SORBY.—The superiority of this instrument, as compared with that first proposed by the author, consists in the employment of a compound, direct-vision prism over the eye-piece. The slit is fixed in the focus of the upper lens of the eye-piece, which is made achromatic, so that all parts of the spectrum may be distinctly seen at the same time. By using a binocular microscope, the inclined tube can be employed as a finder; and, on arranging so that a minute object is in the centre of the field, it will be directly in front of the slit fixed in the eye-piece of the other tube. On looking through this eye-piece, it is easy to see that the object is properly placed in front of the slit; and then, on placing the prism on the eye-piece, as if it were a Nicols's prism, the spectrum of the object can be seen to great advantage. This compound analyzing prism consists of two right angled prisms of flint glass, between which is a rectangular prism of crown glass, and at each end a crown-glass prism of about 75°, all cemented together with Canada balsam. Arrangements are also made in the instrument, by means of a reflecting prism covering half the slit, so that the spectrum of a minute object placed on the stage may be compared with that of a larger object placed on a stage attached to the side of the eye-piece, and thus their difference or identity may be seen at a glance. It is thus easy to compare the spectra of minute crystals and of their solutions; to study the spectra of small coloured blowpipe beads; and, in fact, accurately examine the nature of the light of any minute liquid or solid coloured substances. By using a parabolic reflector attached to the object-glass, opaque bodies may be examined by reflected light; and, as a curious test-object, it may be mentioned that, by this means, a speck of blood on white paper, which would not weigh more than one-millionth of a grain, will show a perfectly characteristic spectrum.

#### SECTION B.—CHEMICAL SCIENCE.

*President*—Prof. W. A. MILLER.  
*Vice-Presidents*—A. W. WILLIAMSON, J. H. GLADSTONE,  
 SIR R. KANE, G. SHAW, DR. A. W. HOFMANN,  
*Secretary*—A. VERNON HARCOURT, PROF. WANLEY, H. ADKINS,  
*Committee*—F. A. Abel, T. ANDREWES, D. ATKINSON, DR. ATTIFIELD,  
 J. ARCHER, H. LOWTHIAN BELL, R. BIGGS, CRAIG CALVERT, R. C.  
 CLAPHAM, W. CROOKES, J. DALES, C. G. B. DAUBENY, H.  
 DEAN, J. BAKER EDWARDS, T. FAIRLEY, D. FORBES, PROF. G. C.  
 GIBSON, J. F. GOLDSMITH, W. H. GRIMSHAW, W. H. GROVE,  
 REV. W. VERNON HARCOURT, W. E. HEATHFIELD, A. HILL,  
 F. M. JENNINGS, S. MACALAN, W. MAKINS, A. MATTHIESSEN,  
 HUGO MILLER, H. M. NOAD, B. H. PAUL, DR. D. S. PRICE, W.  
 DE LA RUE, H. J. RUSSELL, TREHAN REEKS, T. H. ROWNEY,  
 DR. SCHUCHARDT, W. L. SPATT, MAXWELL SIMPSON, R. ANGUS  
 SMITH, H. C. SORBY, J. C. SPILLER, C. TOMLINSON, PROF. VOELCKER,  
 DR. J. E. DE VRY, F. WRIGHTSON.

#### THURSDAY.

The PRESIDENT (Prof. W. A. Miller) said:—"Amongst the problems which have, for some time past, been engaging the minds of philosophical chemists, few are of greater interest than those connected with the idea of the atomicity of the elements. It is well known that chemists now distinguish between the atomic weight and the equivalent of an element; also that, owing to the labours of many distinguished men, amongst whom the names of Williamson, Kekulé, Odling, Cannizzaro, and Wurtz are the most prominent, a classification of the elements into families has been made; and that this classification rests upon what is known as the atomicity of the elements. One group of the elements, like potassium and chlorine, is regarded as monatomic, or usually equivalent in functions to one atom of hydrogen; a second, like oxygen and sulphur, is diatomic, or equivalent in functions to two atoms of hydrogen; a third group, like nitrogen, phosphorus, and arsenic, is triatomic, or equivalent for the most part to three atoms of hydrogen; while a fourth group, like carbon and silicon, is tetraatomic, or equivalent in functions to four atoms of hydrogen, and so on. It would lead us too much into detail were I to attempt to show how this idea of the atomicity of the elements has been applied, and is still in process of application, to the study of the formation of compounds in general, how it endeavours to explain the existence of a limit to their number, and how it even teaches us to anticipate their possible varieties. Among the subjects connected with its development is its bearing upon isomerism, or the remarkable fact of the existence in many cases of two or more bodies of different properties, but yet composed of the same elements, combined in identically the same proportions. Upon this subject, which, at our last Meeting, was characterized by Dr. Odling as the chemical problem of the day, a suggestive theoretical paper was published, about twelve months ago, by Dr. Crum Brown; whilst, in the same direction, Cahours, Kekulé, Beilstein, Fittig, and several other chemists, have published valuable experimental researches. Inquiries of this kind are now acquiring special importance from the numerous cases of the formation of such isomeric bodies by the method of synthesis and substitution, which are daily multiplying. Closely connected with the same subject are the investigations into the constitution of the more complex organic acids, which have been prosecuted so actively during the last five or six years, and which, in the hands of Kolbe, Frankland, Perkin and Dupper, Kekulé, Wurtz, and their pupils, have made such rapid progress. During the past year Frankland and Dupper have especially signalized themselves by their researches upon the lactic and the acrylic series. Two years ago, Frankland, commencing with oxalic ether, and acting upon it with zinc ethyl, obtained from it leucic ether by substituting ethyl for a portion of the oxygen contained in the oxalic ether; and afterwards, jointly with his friend Dupper, he has generalized this reaction. Still more recently, these chemists have traced the connexion between the lactic and the acrylic or oleic series, by reactions in which the abstraction of the elements of an atom of water from the basylous portion of a member of the lactic group converts it into the corresponding member of the acrylic series. In these and kindred investigations, the necessity for the introduction of fixed principles of nomenclature for regulating the construction of names for the recently-discovered compounds has been sensibly felt; and indeed the changes in notation rendered necessary by the alteration in the values assigned to the atomic weights of many of the chemical elements have rendered a general revision of the system of chemical nomenclature a matter of pressing importance. Probably few subjects could more usefully occupy a portion of the time of this Section during the ensuing week than a thoughtful consideration of the changes which it may be expedient to introduce. The meeting of chemists from various parts of Europe with many from distant parts of our own country affords an excellent opportunity for discussing a subject of this kind, where any conclusions, to be practically effective, must secure the concurrence of a majority of the active cultivators of the science. Passing allusion only can now be made to some of the processes of mineral and metallurgic chemistry, such as the improvements in the details of the process for preparing magnesium, the comparative facility with which the recently-discovered metals thallium, rubidium, and cesium and their compounds may be obtained, and the application by Redtenbacher of his observation of the sparing solubility of their alums to the extraction of the new alkalies from the lithium residues of commerce. Of indium, too, the latest of the newly-discovered metals revealed by the spectrum, it must suffice to say that it has been obtained in quantity which places its existence as a distinct metal beyond question. I am indebted to my friend Prof. Roscoe for the small specimens of the metal and its sulphide now upon the table. An extensive branch of industry is now springing up in the improved methods of voltaic deposition of the metals. Weil has, by the use of an alkaline solution of tartrate of copper, contrived to coat iron and steel with a tough, closely adherent sheathing of copper, by simply suspending the articles to be coated by means of a wire of zinc in the metallic bath. No battery is required. Lead and tin may in a similar manner be deposited on copper, iron, or steel, if the oxide of tin or of lead be dissolved in a bath of strong solution of caustic soda. I must, before I conclude, advert to one or two interesting additions to our knowledge upon the side where chemistry and physics meet. Few results, perhaps, were more unexpected than

those obtained by Deville and Troost upon the permeability to gases of certain dense metals at elevated temperatures. They have proved that platinum and iron, when white-hot, become for the time porous, and are rapidly permeated by hydrogen, which will even pass out under the pressure of the atmosphere and leave a vacuum almost perfect within the tube. In one form of these experiments, tubes of hammered and of cast platinum (which in one case was as much as a twelfth of an inch in thickness) were fitted by means of corks into the axis of a shorter and wider tube of glazed porcelain; a slow current of pure and dry hydrogen was then maintained through the porcelain tube, whilst a current of dry air was transmitted through the platinum tube. At ordinary temperatures no change was observed in either gas. A fire was then lighted around the outside of the porcelain tube, and gradually raised until the heat became very intense. At 2000° Fahr. the oxygen contained in the air had entirely disappeared; nothing but nitrogen mixed with steam passed out of the platinum tube, hydrogen had passed through the pores of the platinum and entered into combination with the oxygen of the air within; whilst at still higher temperatures the moist nitrogen became mixed with hydrogen. As the tube cooled, the same phenomena occurred in the inverse order, till, when the ordinary temperature had been regained, no diffusion of hydrogen was perceptible, and unaltered air was collected from the platinum tube. Analogous results were obtained when a tube of soft cast steel was substituted for that of platinum, though the thickness of the steel tube was an eighth, or in some cases as much as a sixth of an inch. From these experiments one practical conclusion deducible is, that air-pyrometers, the bulbs of which are formed of iron or platinum, cannot be relied on when employed for measuring elevated temperatures; glazed porcelain, however, was found to confine the gases completely. Curious as these results are, they are but parenthetical in another series of more general bearing, in which Deville has for some time been engaged, viz., the phenomena of *dissociation*, as he has termed the partial decomposition which compound gases experience under the influence of a temperature more or less elevated. A very striking result was obtained by the use of an apparatus similar to that employed in the experiments just described, but in which a brass or silvered tube was substituted for the platinum or iron tube. A rapid flow of water was maintained through the metallic tube, so that it was kept quite cool, whilst the outer porcelain tube was gradually raised to an intense heat as before. On transmitting a current of pure and dry carbonic oxide through the porcelain tube, the lower part of the surface of the cold metallic tube became covered with deposited carbon, whilst a portion of the carbonic oxide, by combining with the oxygen previously united with this carbon, became converted into carbonic anhydride. Sulphurous anhydride was by similar treatment resolved into sulphur and sulphuric anhydride; and even hydrochloric acid was partially separated into hydrogen and chlorine. These experiments are intimately connected with the attempts made to explain the cause of certain exceptions to Ampère's law, that equal volumes of gases or vapours contain the same number of molecules of each. Chemists now generally assume that the molecule, both of simple and of compound bodies, forms two volumes of vapour, and consequently that the molecular weight of any substance corresponds with the number which represents twice its density when referred to the density of hydrogen, if this be taken as unity. But there are exceptions to this law: pentachloride of phosphorus, hydrochlorate of ammonia, hydriodate of phosphuretted hydrogen, and various other bodies, instead of forming two volumes when one molecule of each is converted into vapour, yield four volumes. In order to explain these anomalies, Kopp and Cannizzaro suppose that, at the temperature at which the vapour-densities of these compounds are observed, the bodies are temporarily decomposed, and, instead of forming one homogeneous vapour, are at the time of the observation really composed of a mixture of vapours. In certain cases this explanation is probably the true one; but its general acceptance has been disputed by Deville himself,

through his results on dissociation seem, to cursory observation, to be in its favour; and it must be admitted that, up to the present time, the arguments and experiments which he has brought forward in opposition to the views of Kopp and Cannizzaro have not been satisfactorily answered. No sufficient proof, for example, has yet been adduced that the well-known anomalous cases of nitric oxide, chlorous anhydride, hydrosulphide of ammonium, cyanide of ammonium, and various other salts of ammonium and the volatile bases, are due to dissociation of their components. This subject is one, however, too intimately connected with the molecular theories at present under discussion to remain long in its actual state. New experiments and evidence will, no doubt, be forthcoming, which will throw further light upon the cause of these outstanding exceptions."

'On a New Form of Spectrum Apparatus as applied to the Microscope,' by Mr. H. C. SOREY.

'Notes on Compounds of Copper and Phosphorus,' by Mr. F. A. ABEL.

'On the Composition of a Marine Boiler Deposit,' by Dr. A. VOELCKER.

'On Silicium in Iron,' by Dr. T. PHIPSON.

'On the Sublimed Oligist of Vesuvius and its Artificial Production,' by Dr. T. PHIPSON.

'A few Words on Sponges as a Source of Bromine and of Nitrogen,' by Dr. T. PHIPSON.

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SECTION C.— GEOLOGY.

President—Sir R. L. MURCHISON.

Vice-Presidents—SIR C. LYELL, PRINCIPAL DAWSON, PROF. JUKES, PROF. HARKNESS, REV. W. S. SYMONDS, W. W. SMITH.

Secretaries—H. C. SOREY, B. W. PENGELLY, REV. P. B. BRODIE, J. JONES, REV. E. MYERS.

Committee—H. BAUERSEN, PROF. S. BECKLES, W. BINNEY, HERR VON DEM BORN, ANTOINE BRADY, H. B. BRADY, P. O'CALLAGHAN, E. W. COOKE, PROF. J. CRUMPTON, DR. DAUBENY, C. H. DAY, HERRE GEHEIMRATH VON DEECHEN, J. EVANS, J. S. ENYS, F. G. FINCH, D. FORBES, C. LE NOVE FESTER, R. W. FOX, G. GALT, G. G. H. HEDDERLEY, G. M. H. HEDDERLEY, J. C. MOORE, J. LIGHTFOOT, B. MACKENZIE, G. MARSH, C. M. MORSE, J. C. MOORE, G. H. MORLEN, R. W. MYLINE, W. S. MITCHELL, G. W. ORMEROD, R. A. PEACOCK, TREHORN REEKS, PROF. F. RÖMER, DR. H. RÖMAY, B. ROSE, CAPT. SPRATT, W. SAUNDERS, W. H. STODDART, PROF. TENISON-WOOD, DR. B. TRISTRAM, C. TWAMLEY, E. VIVIAN, W. H. W. H. WOODWARD, PROF. WRIGHT, H. WOODWARD, REV. H. H. WINWOOD, REV. T. WILTHIRE, G. T. WORTHY, E. HAY LANCASTER.

THURSDAY.

The PRESIDENT said—"Great have been the advances made in geological science in the sixteen years which have elapsed since our last meeting in Birmingham. The lowest sedimentary rocks, which, with most geologists, I considered to be azoic, or void of life, simply because at that time nothing organic had been discovered in them, have, through the labours and discoveries of Sir William Logan and his associates in Canada, been found to contain a Zoophyte, which they termed *Eozoon Canadense*. But the rocks containing this fossil were named Laurentian by Logan long before that fossil was detected in them, and simply because they clearly underlie all the rocks of Cambrian and Silurian age. On the same principle of infraposition, it was my good fortune to be able, in 1855, to point out the existence of these same ancient rocks on a large scale in the north-west Highlands of Scotland; and though I at first termed them Fundamental Gneiss, as soon as I heard of Logan's discovery in North America I adopted his name of Laurentian. In our islands, however, nothing organic has been discovered as yet in these our British fundamental rocks, though they are truly of Laurentian age. For although it was supposed for a moment that the rocks of the Connemara district in the west of Ireland were also of that high antiquity, because it was said that they contained an *Eozoon*, I assert, from my own examination, as well as from information obtained during a recent visit by Prof. Harkness, that the quartzose, gneissose, and calcareo-serpentinous strata of the Bins of Connemara, in which the supposed *Eozoon* was said to exist, are simply metamorphosed Lower Silurian strata. Prof. Harkness will explain this point to you, and will further, I believe, endeavour to convince you that there is no organic structure whatever in the serpentinous rock of Connemara. But, whatever may be the decision of microscopists, I must, as a geologist, declare that, inasmuch as zoophytes of a low order (Foraminifera) unquestionably occur in Laurentian rocks, so it was by no means improbable that the same group of low animals, having, as far as we can detect, no anta-

gonistic contemporaries, and having been, therefore, free from any "struggle for existence," might have continued to be the inhabitants of sea-shores and cliffs during the long succeeding epoch. The mere presence of an Eozoon is therefore no proof whatever that the rock in which it occurred is of the "Fundamental" or "Laurentian" age, that point being only capable of settlement by a clear infraposition of the rocks to well-known and clearly-defined Lower Palæozoic deposits, in the lowest of which, or the Cambrian of the Geological Survey, another form of low Zoophyte, and a few worm-tracks have, as yet, alone been detected. In a word, this discovery of a Foraminifer in the very lowest known deposit, instead of interfering with, sustains the truth of that doctrine which all my experience as a geologist has confirmed, that the lowest animals alone occur in the earliest zone of life, and this beginning was followed through long periods by creations of higher and higher animals successively. Thus, through the whole of the vastly long Lower Silurian period, so rich in all the lower classes of marine animals, whether Mollusks, Crustaceans, or Zoophytes, no one has yet detected a vertebrated creature. Fishes first begin to appear in the latest Silurian deposit, from which time to the present day they have never ceased to prevail; and new forms of vertebrates, adapted to each succeeding period, have followed each other. Every geologist knows how, in the overlying Secondary and Tertiary formations, higher and higher grades of animals successively appear, and how the relics of man or his works have been detected in the youngest only of the Tertiary deposits, though certainly at a period long anterior to all history. We now well know that human beings co-existed with quadrupeds which are extinct; and we also know that the physical configuration of the surface has undergone considerable changes since such primeval men lived. This subject, opened out in France by M. Boucher de Perthes, followed by some of his distinguished countrymen, has in our country received much illustration at the hands of Prestwich, Lyell, Falconer, Lubbock, Evans, and others, and is now a well-established doctrine. But the great feature at the other end of the geological series, to which I revert, is the uncontested fact, which has been passed over by many writers, or misrepresented by others, that there were enormously long periods, following that of the primeval zoophytic deposits, during which the seas, though abounding in all other orders of animals, were not tenanted by fishes. As this is a fact which the researches, during thirty years, of many geologists, amidst the Lower Silurian rocks in all parts of the world, have been unable to invalidate, so it teaches us, in our appeal to the works of Nature, that there was a beginning as well as a progress of creation, and that those writers, however eminent, who have announced that fishes, mollusks, and other invertebrates appeared together, have asserted that which is positively at variance with the results of the researches of this century. I adhere to my long-cherished opinion as to the great intensity of power employed in the production of dislocations of the crust of the earth; and though I cannot subscribe to the doctrine that the ordinary action of deep seas remote from coasts can adequately explain the denudation of the old surface, even by invoking any amount of time, I recognize with pleasure the ability displayed by my able associates, Ramsay, Jukes, and Geikie, in sustaining views which are to a great extent opposed to my own in this great department of theoretical geology. Admiring the Huttonian theory, as derived from reasoning upon my native mountainous country Scotland, and fully admitting that on adequate inclines ice and water must, during long periods, have produced great denudation of the rocks, I maintain that such reasoning is quite inadequate to explain the manifest proofs of convulsive agency which abound all over the crust of the earth, and even are to be seen in many of the mines in the very tract in which we are assembled. Thus, to bring such things to the mind's eye of persons who are acquainted with this neighbourhood, I do not apprehend that those who have examined the tract of Coalbrook Dale will contend that the deep gorge in which the

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Severn there flows has been eaten out by the agency of that river, the more so when the deep fissure is at once accounted for when we see the abrupt severance that has taken place between the rocks which occupy its opposite sides. In that part of Shropshire the Severn has not worn away the rocks during the historic era, nor has it produced a deeper channel, whilst in its lower parts it has only deposited silt and mud, and increased the extent of land on its banks. Then if we turn to the district in which we were last assembled, the valley at Bath is known to be the seat of one of those disturbances to which my eminent friend, Sir Charles Lyell, candidly applied the term "convulsion"; the hot waters of that city having ever since flowed out of a deep-seated fissure, clearly marked by the strata on the one side of the valley having been upheaved to a height very different from that which they once occupied in connexion with those of the other side. When, indeed, we look to the lazy-flowing, mud-collecting Avon, which at Bath passes along that line of valley, how clearly do we see that it never scooped out its channel; still more, when we follow it to Bristol, and observe it passing through the deep gorge of mountain limestone at Clifton, every one must then be convinced that it never could have produced such an excavation. In fact, we know that, from the earliest periods of history, it has only accumulated mud, and has never worn away any portion of the hard rock. From such data I conclude that we cannot apply to flat regions, in which water has no abrading power, the same influence which it exerts in mountainous countries; whilst we are also compelled to admit that the convulsive dislocations of former periods produced many of those gorges in which our present streams flow. To pass, indeed, from the environs of Bath and Bristol, and even from the less distant Coalbrook Dale, you have only to contemplate the tract which lies between Birmingham and Dudley, and endeavour to satisfy the mind as to the processes by which it has been planed down before the surface was covered by the Northern Drift; for the great dislocations which this tract has undergone, as proved by many subterranean workings, must have left a highly irregular surface, which was so levelled by some very active causes as to obliterate the superficial irregularities corresponding with the interior disturbances. In short, what was this great power of denudation which took place in a tract where there are no mountains whence powerful streams descended, and in which there are no traces of fluvial action? Must we not in candour admit that such denudation is as difficult to account for as it is to explain by what possible gradual agency the vast interior of the valley of elevation of the Weald of Sussex and Kent, and that of the smaller valley of Woolhope in Herefordshire, have been so absolutely and entirely denuded of every fragment of the enormous masses of débris which must have encumbered these cavities, as derived from the rocks which once covered them? Placing no stint whatever on the time which geologists must invoke to satisfy their minds as to the countless ages which elapsed during the accumulations of sediment, I reject as an assumption which is at variance with the numberless proofs of intense disturbance, that the mechanical disruptions of former periods, and the overthrow of entire formations, as seen in the Alps and many mountain chains, can be accounted for by any length of existing causes."

"On some Ancient Drifts and Old River-Beds of Siluria," by the Rev. W. S. SYMONDS.

"On the Insulation of St. Michael's Mount," by Mr. W. PENGELLY.

"On the Geology of Coalbrookdale," by the Rev. W. FURTON.

"On the Extensive Deposits of White Clays and Sands in North Wales, antecedent to the Boulder Clay Drift," by Mr. G. MAW.

"On a Deposit near Lilleshall, Salop, containing recent Marine Shells," by Mr. C. J. WOODWARD.

"Additional Observations on the Geology of the Lake Country," by Prof. HABKNESS and Mr. H. NICHOLSON.

#### SECTION D.—ZOOLOGY AND BOTANY.

*Vice-Presidents*—Prof. BABBINGTON, Prof. BALFOUR, G. BENTHAM, Sir J. LINDSEY, Sir W. JARDINE, J. G. GWIN JEFFREYS, P. L. SLATER.  
*Secretaries*—E. PERCIVAL WRIGHT, REV. H. B. TRISTRAM, J. ANTHONY, REV. C. CLARKE.

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#### THURSDAY.

"Report on Dredging in the Channel Islands, (Mollusca)," by Mr. J. G. JEFFREYS.

"Report of the Committee appointed to investigate the Marine Fauna of the Channel Islands, Part II," by the Rev. A. M. NORMAN.

"Report on Dredging on the Coast of Aberdeen," by Mr. J. G. JEFFREYS.

"On the Identity of Origin of Starch and Chlorophyll," by Dr. W. HINDS.

"Notes on the Development of a Deep-Sea Sponge in a Marine Aquarium," by Mr. W. R. HUGHES.

"On the Turdus Migratorius," by the Rev. A. W. M'KAY.

"On the Extraordinary Partiality shown by Insects of the Genus *Laverna* for Plants of the Order Onagraceæ," by Mr. H. T. STAINTON.

"Phosphorescence in Connexion with Storms and Disease," by Dr. T. MOFFAT.—Dr. Moffat stated that the results in this paper were deduced from observations extending over a period of four years. He showed by tables that the readings of the barometer were higher when phosphorus was non-luminous than during its luminous periods; that the degrees of temperature and humidity were lower during the former than the latter condition, and that it was seldom luminous during the prevalence of the north wind. By similar tables he showed also that periods of phosphorescence invariably commenced with decreasing readings of the barometer, increasing temperature and humidity and the setting in of the south wind; and that they as invariably terminated with increasing readings of the barometer, decreasing temperature and humidity and the setting in of the north wind.—Dr. Moffat next gave tabulated results from ten years' observations on ozone, and pointed out the remarkable coincidence which exists between periods of phosphorescence and ozone periods, and those of non-phosphorescence and no ozone. This connexion he showed to exist at a former Meeting of the Association. The atmospheric conditions of luminous and ozone periods, he remarked, were those of the Equatorial or sea wind, and those of non-luminous periods and no ozone were the conditions of the Polar or land wind. The author next showed the connexion which he believes to exist between the luminosity of phosphorus and storms and gales by referring to a table in which the dates of 62 of the late Admiral FitzRoy's cautionary telegrams were given. By this table it appeared that 83·0 per cent. of the telegrams were sent to different ports on days on which phosphorus was luminous, or that it became luminous at that per-cent-age within a mean period of 10 hours from the issuing of the telegram. And of 19 periods of luminosity, 100 per cent. commenced within a mean time of 10 hours from the date of the telegram. In the same table the highest readings of the barometer on the days before the telegrams, and the lowest readings on the days after them were given; and also the quantity of ozone and the force of the wind on the days before and after them. The results showed that the mean of the readings of the barometer on the day before the telegrams was half an inch higher than that of the readings on the days after; and that the quantity of ozone and the force of the wind were doubled on the days after the telegrams. The setting in of these storms, Dr. Moffat observed, are accompanied by diseases of the nervous and vascular systems, and diarrhoea, often attended with vomiting and cramps in the limbs; and he showed by the table just referred to that 93·5 per cent. of the telegrams were accompanied by one or more

of such diseases. The author stated, however, that that class of diseases often occurred when no telegram was sent out; but that as a rule they accompanied similar atmospheric changes, which differed only in degree; observing, as a rule, that if any of these diseases took place, the barometer readings would decrease, temperature would increase, ozone, if absent, would appear, and the wind, if in north points, would fall back upon south points, and would increase in force; and that if the barometer readings were below the mean, and the temperature above the mean of the season, a storm would follow. From a series of experiments which the author had performed, and which he explained, he satisfied himself that decreasing pressure and increasing temperature were favourable to phosphorescence of phosphorus, and consequently the development of ozone; and that increasing readings of the barometer and decreasing temperature were unfavourable to both. Revolving storms or cyclones, he said, possess these conditions—the warmer portion, with minimum of pressure, cirri and maximum of ozone, which is favourable to phosphorescence, veering from south-east to north-west, by way of south and west, and the colder portion, with maximum of pressure and minimum of ozone, which is unfavourable to phosphorescence, veering from north-west to south-east, by way of north and east. With regard to the cause of the diseases above named, Dr. Moffat is of opinion that they were the result of the retention of urea and other urinary solids in the blood, and diminished atmospheric pressure. The fact that the cutaneous transpiration and the evaporation from the surface of the lungs had an important influence upon health, he said, was admitted by all physicians. He showed, by tabulated results, obtained from a series of observations made with an instrument which he had constructed for ascertaining the amount of evaporation through human skin, that the minimum of urinary solids occurred with the maximum of evaporation through the skin, and vice versa, and that the quantities of both varied with variations in the atmosphere.—Dr. Moffat concluded his paper by observing that although storms are accompanied by some forms of disease, they are, nevertheless, highly beneficial in a sanitary sense; for they not only ventilated cholera localities and fever-nests, but they carried with them a store of nature's deodorizer and disinfectant, ozone; and stated that cholera was at once checked, and it disappeared with the setting in of the equatorial or ozoniferous current of the air. From this he had been led to use phosphorus, which, when in a luminous state, produces ozone, as a disinfectant, and he had used it as such for five years. He exhibited another table, showing the results of ten years' observations, in which the connexion of the maximum of cases of choleraic diarrhoea with the minimum quantity of ozone was clearly demonstrated.

The Rev. A. M. NORTON said the paper of Dr. Moffat would be of much value, and he, for one, was glad that it had not been taken to the Chemical Section, to which it properly belonged, as he would then have been deprived of the pleasure of hearing it. He thought that it threw great light on the subject. He was inclined to think that animals were phosphorescent only under certain conditions of the atmosphere; and he believed that if it were so, an explanation would be given of the cause of certain animals being considered phosphorescent by some persons, and not so by others.—Dr. MOFFAT said that the question had now entered on a new phase, and was not yet sufficiently matured; but his belief was that phosphorescence had much to do with the production of atmospheric ozone, if it was not really its source; and that if phosphorus vapour possessed the property of rendering iron magnetic, as he believes it does, the phosphorescence of the ocean, the development of ozone, and the disturbance of magnets during storms could be accounted for.

#### SUB-SECTION D.—PHYSIOLOGY.

*President*—Prof. ACALAN.  
*Vice-Presidents*—J. DAVY, Prof. ROLLSTON, Prof. LIONEL BEALE, Prof. VAN DER HOEVEN, E. SMITH, Prof. J. HUGHES BENNETT.  
*Secretaries*—W. TURNER, A. FLEMING, T. P. HESLOP, O. PEMBERTON.  
*Committee*—J. B. BARKWELL, F. T. BOND, C. BROOKE, F. CHANCE,

T. S. Cobbold, T. A. Carter, R. Dunn, M. Foster, R. Garner, G. D. Gibb, A. Gamgee, J. Deakin Heaton, W. Hinds, R. P. Howard, W. R. Hughes, G. M. Humphry, Furzeaux T. Jordan, W. H. Kelburne King, W. H. Lightbody, Prof. Macdouall, J. R. Milner, Prof. Parkes, H. Power, Dr. Ramsay, S. W. Richardson, E. Water.

## THURSDAY.

The President gave his opening Address.  
'On the Effects of Scanty and Deficient Food,' by Dr. J. DAVY.  
'On Life,' by Dr. L. S. BEALE.  
'On the Formation of Pus in Reference to the Fallacious Doctrine of Cell Pathology,' by Dr. J. H. BENNETT.

## SECTION E.—GEOGRAPHY AND ETHNOLOGY.

*President—Sir H. RAWLINSON.*  
*Vice-Presidents—Sir R. I. MURCHISON, Major-General Sir A. S. WAUGH, J. CRAWFORD, Dr. BOSWORTH.*  
*Secretary—CLEMENT R. MARKHAM, H. W. BAKER, T. WRIGHT.*  
*Committee—Dr. A. Balfour (Brentford), Admiral Sir E. Belcher, C. Carter Blake, C. B. Bracque, L. Bulwer, F. O'Callaghan, J. F. Collingwood, M. D. Conway (New York), B. Davis, G. Dawson, J. Dickinson, R. Dunn, J. Evans, Dr. B. W. Foster, F. Galton, F. Hindmarsh, T. Hodgkin, Lord Houghton, Evan Hopkins, Dr. J. Hunt, Prof. K. H. Latimer (Berlin), J. M. K. Mackenzie, W. H. Miller, Dr. James Moore, Michael A. Newton, Charles Cristoforo Negri (Italy), Admiral Ommanney, C. Ratcliffe, J. Reddie, A. Adams Reilly, S. Sharpe, W. Spottiswoode, Dr. Scott, J. Sidney Smith, Rev. H. B. Tristram, E. B. Tyler, Dr. A. Vambery (Hungary), A. R. Wallace, C. White, J. S. Wright.*

## THURSDAY.

The PRESIDENT opened the business of the Section with a brief review of the principal subjects of Geographical interest which would be brought forward, or which had come to notice since the Anniversary Address of the President of the Royal Geographical Society had been published in June last. He was sorry that the Meeting would not be gratified by the presence of any of those geographical celebrities who in the former year had attended the Meeting of the Association. Mr. Baker, the famous discoverer of the duplicate source of the Nile, had not yet arrived in England, although daily expected, and Dr. Livingstone had recently left on his new mission to explore the country between the two great African lakes, Nyassa and Tanganyika. They would be compensated, however, to some extent by the presence of the Hungarian Dervish, M. Vámbéry, who had travelled, as they were aware, disguised as a mendicant, through portions of Central Asia which had never before been visited by a European, and he would contribute an original paper on the principal subject which had engaged his attention, namely, the origin of the Hungarian race. He would also give an account of an excursion to Bokhara, a city of great celebrity in the centre of Asia, and at the present time the focus of matters of great interest, connected with the gradual conquest of the valley of the Jaxartes by the Russians. They would also have brought before them papers on the very interesting subject which now occupied a large share of public attention—the Exploration of Palestine. They would hear some account of Capt. Wilson's services, and Mr. Grove, the Secretary to the Palestine Exploration Fund, would acquaint them with the objects and prospects of the society. Africa was another subject which had, as they were aware, occupied the attention of the Royal Geographical Society and the public for a long series of years. The splendour of the last meeting was dimmed by the melancholy loss of Capt. Speke. On the present occasion they had no Nile explorer present in person; but he hoped to hear the accomplished President of the Geological Section in person read some letters which he had received from Mr. Baker, dated from Khartum, giving details of the last great discovery. Sir Roderick Murchison had also received, during the last few days, through the Foreign Office, information from another eminent explorer, Baron von der Decken. This enterprising African traveller had at length departed from Zanzibar on his journey up some of the East African rivers to the north of that place, in his attempt to reach the eastern part of the Nile basin. The Baron started on the 15th of June with his two steam-vessels, convoyed by H.M.S. Lyra. It is his intention to attempt, in the first instance, to enter the river near Toola, and in case that river should be too shallow to receive his vessels, he would revert to his original plan and ascend the Jub river, the bar of which could only be passed at one period of the year. Mr. Thomas Baines, the artist-traveller in the interior of Southern Africa, would read a descriptive paper on the great

cataract of the Zambezi, and exhibit plans and drawings explanatory of the curious formation of the falls. With regard to America, they would have an interesting paper on the subject of North Polar exploration, from Mr. C. R. Markham, giving the latest information respecting expeditions to the North Polar region. They would hear also an extract from a letter relating to the exploring expedition recently fitted out by Mr. Grinnell, the celebrated American merchant. This expedition is commanded by Capt. Hall, and is intended to search for further remains of the Franklin expedition. There was one other paper which was considered, as far as geographical information was concerned, to be the most important that would be submitted to the meeting. This was from the pen of an English gentleman, Mr. W. Chandless, and detailed the route of a journey he had just performed along the whole course of the river Purus, one of the most important and least known tributaries of the Amazonas, which he had explored and carefully mapped for a distance of 1,870 miles. There was one item of information with regard to Australian exploration which he was glad to communicate to the meeting. This was, that the South Australian Government had very recently, and through the representations of the Council of the Royal Geographical Society, voted an additional £1,000, to Mr. Macdouall Stuart, the first explorer who had crossed the Australian continent. Other papers would be read of considerable interest connected with Alpine ascents, one of them by Mr. E. Whymper, with whose name all would be well acquainted. The numerous papers on anthropological and ethnological subjects he would not attempt to particularize, but many of them would be found of very great interest.

'Report of the Results of Surveys relating to the Water Supply of Jerusalem,' by Capt. T. M'NEILL and Capt. WILSON, R.E.—This was an elaborate Report to the Syrian Improvement Committee, by the engineers employed, of their surveys in the neighbourhood of Jerusalem, with a view to improve the water supply of the city, and was introduced, with additional remarks, by Dr. T. Hodgkin. The survey was undertaken in the autumn of 1864. The question of the water supply of Jerusalem had been, from an early period, of much interest, the more so on account of the natural difficulties which attended the subject. Looking at the remains of ancient works, there is nothing to indicate that Jerusalem ever had a large supply of water brought from a distance. The fact of the skill shown in procuring and conveying the small quantity of water by the conduits to the town, and in the construction of reservoirs for catching the surface water, shows that this necessary element must always have been scarce. The chief supply must have consisted of rain water collected within the town and stored in tanks, as in the present day. Jerusalem is about 2,700 feet above the Mediterranean, and 4,000 above the Dead Sea, and is placed pretty nearly on the crest of the hills which define the watershed of the country. The road from Jerusalem to Bethlehem on the south, and to Bireh on the north, roughly marks this line. The road to Bireh rises from Jerusalem, Bireh being about 300 feet above the city. The country north of Bireh maintains its elevation for some distance; but here, as in nearly all cases, the country is cut up by valleys, which form a very peculiar feature, influencing not only the landscape but the water question. The district around Jerusalem consists principally of the steep sides of valleys which twist and encircle each other, their general direction being towards the Mediterranean on the west, and the Dead Sea on the east. The valleys are deep, the sides rocky and bare of soil, which appears to have been carried to the valley-bottoms by the winter rains, and the soil absorbs the rain, instead of allowing it to run over the surface. The cause of the present sterility of the district is the destruction, by neglect, of the artificial terraces which probably existed formerly, and which, by retaining the soil on the steep slopes, led to the ancient fertility of the country. The entire absence of streams of water in the valleys leads to the belief that there exist subterranean water courses. The Brook Kedron is crossed by an

arch nine feet wide. In some years, no water at all flows under the arch. After three or four days' rain, it will run on the surface for a few hours, 2 or 3 feet deep, but ceases to flow in one or two hours after the rain abates; if, however, heavy rain continues with little interruption for ten days, the stream will flow on for two or three days after the rain has stopped. The depth of the soil in the valley-bottoms is probably very great; in the valley of Urtas it was found to be more than 20 feet. The valleys are, consequently, very ill adapted for reservoirs of water, although the rainfall is amply sufficient. The nearest approach to a good site is the Wady-el-Byar, on the road between Jerusalem and Hebron. The authors found no trace of ancient irrigation works; the Pools of Solomon would only water 65 acres for six months in the year, at the moderate depth of 2 feet, spread over the area watered. Near Nablus, and at other distant places, there are large streams of perennial water flowing out of the rock; these might (at a very considerable cost) be carried round the slopes of the hills and conveyed from valley to valley for irrigation purposes. The ancient reservoirs for rain water, of which there are many, are in a ruinous state, except the upper Pool of Gihon and Hezekiah's Pool. The former is 315 feet long, 208 feet wide, and 20 feet deep, and holds about 8,000,000 gallons, which, allowing 2,000,000 for evaporation, gives 6,000,000 as the annual available supply of the pool. Hezekiah's Pool holds about 4,000,000 gallons. Careful measurements and details of construction of the various reservoirs are given by the authors, with suggestions for their repair; their total capacity would then be 44,147,000 gallons. Deduction would, however, have to be made for evaporation, which, calculating the probable amount of annual evaporation in this dry climate, with its mean temperature of 62·6 degrees at 60 inches, would be 8,881,562 gallons. In the temperate zone, with a mean temperature of 52 degrees, the annual evaporation has been found to be between 36 and 37 inches. On the coast of South America (north latitude 10° 30'), with a mean temperature of 81·86 degrees, it was ascertained to be more than 100 inches annually.

'On the Exploration of the Holy Land,' as proposed by the Palestine Exploration Fund, by Mr. G. GROVE.—The author said, notwithstanding the numerous books of travel that had been published respecting Palestine, we were still in great ignorance with regard to all that concerned the life of the people. No work has been written in this country similar to that of Mr. Lane on the Modern Egyptians. It had been said that if the Lower Nile valley and its inhabitants were now swept away, we should still have preserved to us a complete picture of the nations which have peopled it, in this exhaustive work. Now, what had been done for Egypt it behaved us to endeavour to do for the Holy Land. We knew nothing of the treasures of ancient Egypt until they were commenced to be dug up by Belzoni. The explorations of Sir Henry Rawlinson and Mr. Layard had, in the same manner, disclosed the remains and led to much of our knowledge respecting the great nations which peopled the plains of the Euphrates and Tigris. The same still remained to be done in Palestine. There must be a vast amount of treasures in arms, coins, weapons and utensils still buried in the soil, which would throw great light on the domestic life of the Jews. The soil of Palestine was virgin; there had not yet been a spade put into the mounds of ruins which existed in that country. There were great difficulties to be surmounted in the way of carrying out these explorations, the chief one being the difficulty which had hitherto existed of travellers being able to remain long enough in the country. Besides, it was in the unfrequented districts that the Exploration Society was most desirous of penetrating, and in these places travellers especially qualified, and having the means of remaining long, are required, to pursue continued investigations. One most cogent reason for undertaking the exploration was furnished by the fact, that the ancient traces were fast passing away, and the native customs of the people disappearing before the advance of Western civilization. There was a curious orgie,

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lying between the Comoro islands, with Nearest Mohilla, south-east thirty miles and Mayotte. It lies on the island of Mayotte over a length of 15,000 feet, a great sea number of islands, a sultana, the island of Zandzzi, which has been a steam school for thousands of children. The island of Zandzzi is a popular place, where the inhabitants are called the shabuhi, is written in Arabic, even if English is the language of the people. The vice of the island is a breezy heat. The volcanic

doubtless one of those practised formerly by the priests of Baal, which had almost fallen into disuse, and such customs as this, if now investigated, would tend to throw great light on the customs of the people. Much also still remained to be done in the geography of the land. As an instance of the confusion which still exists in the orthography of places, he would mention the fact of a place being named in one map *Embarrey*, and in another *Mu-leighkik*. The sites of many of the most celebrated places in Holy Writ were yet matters of uncertainty. In short, it was a systematic, leisurely, and thorough investigation of the Holy Land which the society proposed to themselves to undertake.

SIR JOHN BOWRING made a few remarks on the importance of the travellers employed by the society cultivating the confidence of the people, and making some concessions to their prejudices if they wished to do much. He thought the new society highly necessary.—The Rev. H. B. TRISTRAM was of opinion that the society would find ancient Jewish remains with less facility in Jerusalem than in retired country places.

'On the Seychelle Islands,' by Lieut.-Col. LEWIS PELLY.

'Letters on the Discovery of Lake Albert Nyanza, from Mr. S. W. Baker to Sir R. I. Murchison.'—These letters, the contents of which have already been published, contained a description by the writer of his discovery of the great central African lake (*Luta Nzigé*), the existence of which had been previously pointed out by Capt. Speke. Mr. Baker, at the date of the last letter (June 21), was on the point of leaving Khartum for England, via Souakin and the Red Sea.

SIR R. I. MURCHISON, Mr. F. GALTON and the PRESIDENT, made some remarks on the subject of Mr. Baker's discovery, agreeing in its supplying a strong confirmation of the truth of a part of Capt. Speke's map, which had been most severely criticized. The President reminded the Meeting that the fact of the exit from the lake of the Nile (or the river which flowed past Gondokoro) still remained to be settled by direct observation.

'On the Comoro Islands,' by Lieut.-Col. L. PELLY.—The Comoros are a group of four islands lying between the northern extremity of Madagascar and the East African coast. The most northerly is Comoro proper, an island about thirty miles in length, with an average breadth of about ten miles. Nearest to this, and a little further south, is Mohilla, the smallest of the four. Johanna, lying south-east of Mohilla, and distant from it some thirty miles, is the second in respect of extent; and Mayotte, thirty miles south-east of Johanna, is third. In the year 1841 the French established themselves on the little island of Zaondzi, near Mayotte, gaining their position by espousing the cause of one of the contending chiefs, on the condition of his ceding Zaondzi to them. It is now fortified and furnished with an arsenal, and it was at one time planned to make Mayotte a military and naval position of the first class; but the plans seem to have been discarded since the revolution of 1848. Mayotte has reef-locked anchorages extending over a length of more than thirty miles; communication is kept up with Bourbon by means of a small steam schooner of war, and Col. Pelly found some thousand tons of coal, besides patent fuel, stored at Zaondzi. The staple product of Mayotte is sugar; if well cultivated, the island might export from 15,000 to 20,000 tons per annum; but there is a great scarcity of labour; the population is stated to number about 7,000 souls. The island of Johanna is a sultanate, without any direct relation with the other islands, the present chief being named Abdulla, the descendant of a family which has ruled the island for the last century. Johanna contains a population of 12,000, including aborigines, half-caste, slaves, and foreigners. A *lingua franca*, called the Johanna language, is current, but Ki-mahili is also spoken; the Arabic character is used in writing, no matter what the language may be, even if English. The people profess the Mohammedan religion, and are apparently quite free from the vice of drunkenness. The climate is salubrious, sea breezes and frequent showers tempering the heat. The soil is composed of the detritus of volcanic rocks and humus. Coffee thrives excel-

lently, and will probably form ultimately the staple product of the island. The trade of Johanna is at present not large, the total value of the past year's (1860) imports being about 4,500£., and it is carried on chiefly with Zanzibar and the French settlements at Mayotte and Madagascar. Mohilla is governed by a queen related to the royal family of Madagascar. The island has a population of about 4,000 souls. Of all the Comoro group Comoro proper is the most remarkable for the magnificence and wildness of its scenery. From its surface rises an active volcano, 8,000 feet in height, which frequently vomits forth streams of lava, which flood its flanks and form new promontories and islands in the surrounding ocean. When the English consul, Mr. Sunley, visited the island after an absence of four years, he found a lava reef three-quarters of a mile in length jutting out near his old landing-place and perplexing his topography. The principal town is Maroni, but the island is partitioned among many chieftains, who are jealous of their land and water holdings.

Mr. J. CRAWFORD said one of the most curious circumstances connected with the two groups of islands described by Col. Pelly was that one (the Seychelles), when first discovered, was destitute of human inhabitants, whilst the Comoros were well peopled. Extremely little, however, was known concerning the aborigines of the Comoro islands, and they had been for several centuries dominated by immigrant Arabs.

'On the Origin of the Hungarians,' by Dr. A. VÁMBÉRY.—The author's arguments for the Turco-Tartar rather than Finnish derivation of the Hungarian nation were drawn from history, ethnology, and philology, but chiefly the latter, into which he entered in some detail. He had found the Hungarian and Turco-Tartar languages so closely connected, both in their grammatical forms and vocabulary, that he could come to no other conclusion than that the Hungarians had migrated, at a remote period, from the western parts of Central Asia.

The PRESIDENT said it was an historical fact, admitting of no dispute, that the Hungarians migrated from the banks of the Volga to their present seat in Europe; but there was little doubt that their residence on the Volga was only one stage of a longer migration. He was inclined to believe that they were rather of Finnish than Turco-Tartar origin, and that they came from the region north of the Altai, in Siberia. The very remarkable analogies which Dr. Vámbéry had discovered between the languages he had investigated, went far to change his (the President's) views; he had hitherto thought that the words common to Hungarian and Tartar had been derived by the Hungarians from the Turks, through the modern intercourse between the two nations.

'Ethnology of the Hindoo-Chinese Nations,' by Col. PHAYRE.

'Shores of the Persian Gulf,' by Lieut.-Col. L. PELLY.

'Notes on Formosa,' by Mr. R. SWINHOE.

#### SECTION F.—ECONOMIC SCIENCE AND STATISTICS.

*President*—Right Hon. LORD STANLEY.

*Vice-Presidents*—Right Hon. Sir J. PAKINGTON, Sir J. BOWRING, W. F. PITT, T. A. FAUCETT, W. NEWMARSH, Prof. ROGER OF OXFORD, W. L. SABINE.

*Secretaries*—E. MAGRORY, J. D. GOODMAN, G. J. JOHNSON.

*Committee*—T. AVERY, W. ROGERS BANKS, W. BARLOW, C. H. BRADBIDGE, J. T. BUNCE, W. CAMPS, A. T. DANSON, J. E. FOLLOWES, A. H. HARRIS, H. H. HILL, J. H. HOBSON, SIR WALTER JONES, W. KERSEY, Baron Kukuk (Austria); Prof. LEONE LEVI, J. McCLELLAND, T. DE MESCHIN, Dr. ORPEN, C. RATZEL, A. RYLAND, S. TIMMINS, E. VIVIAN, R. WILKINSON, J. YATES.

#### THURSDAY.

The PRESIDENT said:—"Let me say a word as to the right application of the statistical method. To use figures rightly, assuming that they are accurate in themselves, is not so easy a matter as it is apt to appear. There are various fallacies into which unpractised statisticians fall, one or two of which may be worth noting. One, perhaps the commonest, arises from the use of too narrow a basis for calculation. To explain my meaning: given, a certain class of men between certain ages, as soldiers, agricultural labourers, citizens, and the like, the aggregate life among 10,000, or even among 1,000, of them, will be practically a fixed quantity—you can determine it beforehand, but the length of any single life is of course uncertain;

and if so few as 10, 20, or even 100 lives are taken, the element of chance, or what we call chance, is not sufficiently excluded, and a single exceptional case affects the general result. Another error, less easy to detect, arises from not taking into account all the cases which affect the result. Thus, supposing that the question is, the effect produced by reduction of a tax on increasing consumption of the article taxed, it is a natural but a very obvious mistake to argue *post hoc ergo propter hoc*—to speak of that augmented consumption as arising solely from the reduction of duty which preceded it, ignoring other causes, such as general prosperity, and consequent augmentation of the consuming power, cheapening the means of transport, or lowering of the actual cost of production, by mechanical improvements or otherwise, of the article consumed. Or, to take an illustration from a different class of subjects: Suppose it is desired to ascertain the average mortality of a certain class, that for this purpose we take the mortality in that class during a certain number of years, and that during one of those years an epidemic of a destructive character has prevailed. You of course strike out that year from the series, as widely affecting the average. But if you stop there your calculation is again vitiated, though in a different manner; for it will almost always happen that an epidemic sweeps away a larger proportion of unhealthy than of healthy lives; and so the years succeeding, their mortality having been, so to speak, anticipated, are above that true average in point of health, and do not form a fair basis for a permanent calculation. Another and still more remarkable example is the existence of an hospital or sanitarium in an otherwise healthy locality. Unless that be allowed for, it is clear that the place in question will be credited with many deaths which are not due to it—nay, this absurdity follows, that the more the spot is resorted to by invalids (Madeira would be a case in point) on account of its very healthiness, the higher its apparent mortality becomes. This last example is not without its practical importance, especially in cases of military mortality. It is obvious that by a system of discharging at once, or offering inducements for the retirement of men who are likely to become invalids, a fictitious appearance of healthiness in a camp or army may be produced, the diseases which arise there not being suffered to work out their natural result, and their existence, or rather the existence of causes predisposing to them, being thus effectually concealed. A third source of error, perhaps less material, but still worth notice, is that of confounding in one class facts not identical. For instance, the average death-rate of England is easily ascertained; but if you wish to apply that practically to a particular place or class, you must not take the figures as they stand. The death-rate of towns is not that of rural districts—the mortality of infants, &c. generally exceeds that of adults—the term of life is shorter in the labouring than in the well-to-do classes. Age, class, locality, must be separately determined before you can arrive at even an approximately accurate conclusion. The figures which serve for all collectively, precisely because they do so serve are illusory if applied to any one of these in particular. I mention such possible mistakes in order to show how utterly wide of the mark is that idea, that to work by and make statistical calculations is a merely mechanical function, needing no ability beyond that of a careful clerk. They require common sense and vigilance against errors, like every other method of inquiry. Figures do not, indeed, deceive you; but if you put them to a use they are not meant for, they will let you deceive yourself. I suppose it is hardly necessary to remind you of the uses of the statistical method as applied to national affairs. If a man in private life finds his money going too fast, and wants to retrench, the first thing he does is to say, 'I must keep regular accounts.' So individuals keep diaries of particular matters in which they feel interested—not trusting to vague recollections, but setting down their notes day by day. Every person of observant habits, or engaged in any pursuit which requires accuracy, is in some sense a statistician. And it is hardly possible to overrate the value of figures, partly as checking the universal tendency

stating that it was taken off the beat part slow, that a pound weight to describe objections a notice to principle, the fibre close up fast hold of whilst the seed was put in fibre. Thus or injured to length to width of a roller them; the blunt steel and recede trics, which direction opposite di blade, then seeds; thin motion of trics are on beater, and wheel on all others he said the much work times as same time It gave a given sa

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to exaggeration—not wilful, but a kind of mental illusion, which operates whenever we are deeply interested,—partly as giving definiteness and precision to ideas which would otherwise remain floating in our minds in a vague and, therefore, comparatively useless form. For instance, to say generally that a given trade or employment—that of a grinder or of a soldier in the tropics—is unhealthy, conveys a very faint impression, and affects our feelings but slightly. But put it in this way, that the average length of life in some occupations is shorter by ten or fifteen years than that of an ordinary labourer, and not only habitual calculators, but that man himself, however ignorant or thoughtless he may be, is able clearly to realize the sacrifice he is making by going into that business. So with regard to questions of drainage, of ventilation, of food, of the use or abuse of strong drinks, it is the statistical test, employed on a large scale, which alone can be conclusive. I say on a large scale, for it is of the very essence of statistical inquiry that by dealing with masses it eliminates individual peculiarities. We reason back from the mass to the individual; the unit of the statistician, his typical or representative man, is the average man of many thousands. We are familiar with the effect on public health of the establishment of sanitary statistics. Let me point out one or two more instances in which figures form a part, and a very important part, of the diary of our national life. Take the Post Office returns, showing an increase of the correspondence as compared with the past, and the difference which exists at the present day in the amount of letter-carrying between one part of the country and another—say between the population of Ireland and that of London. Take the Registrar-General's returns of marriages, and note how the number of these, relatively to the population, rises or falls as the material condition of the masses is for the time better or worse. Take the annual publications and the Customs and Excise departments. Take a census abstract of the occupations of the people. Take our criminal statistics—a comparatively new department, and probably still admitting of much improvement. You may read in these collectively the social and economical history of the age in which we live. And note everywhere the absence of mere chance. We speak of chance—it is a word we must use for convenience sake; but we really mean by it, not that the result of the thing discussed is in itself uncertain, but that some or all of the determining causes of such results are to us unknown. We imply, not the absence of a law, but inevitable ignorance on our part of what the law is. When you find uniformity, or something which closely approximates to uniformity, as in the number of letters yearly posted without addresses—in the number of widows and widowers who marry—or in the number of detected offences of the same nature committed within the year—it is impossible not to be impressed, however trifling may be the illustration of them, with the permanence and steadiness of the laws which regulate our existence. Now, is there any use in knowing that? I think there is. In the first place, no knowledge that bears upon human life is useless, even though we do not at the moment see the practical application to which we can put it. A discovery always turns to account in some way. The most important mechanical inventions owe their origin to purely mathematical theories which the authors of them never dreamt of so applying. In the next place, it is only by observing men in masses, and with the aid of all such helps to accuracy as we can command, that we can fairly appreciate the influence of general causes, whether material or moral, on individuals. Take a town in which a thoroughly good system of drainage has been established: you want to learn what has been the effect of that system on health. Question each person or each family separately, you will probably get very conflicting and dubious testimony. But register the deaths and causes of death, compare them with what they were before, and with similar returns in other places, and the decrease will give you at once a measure of what has been effected. And, lastly, of that large class of human evils which are separable as well as preventible—evils affecting not life but property—or affecting life in

its relation to property—there are very few to which the principle of insurance may not be applied. Now, what does insurance mean? It is the opposite of gambling. The gambler, desiring to gain something that is not his, risks in return something of that which he actually possesses. The insurer, seeking to preserve that which he has, submits to a certain small fixed deduction, and thereby precludes the occurrence of a much larger possible loss. The one purposely increases the hazards of life, the other purposely diminishes them. Now, if as I believe to be indisputable, a sense of security is one of the first requisites both for material improvement and moral development, whatever creates or strengthens that sense of security is an element of human progress; and when a proprietor has guaranteed himself according to the nature of his property against fire, against shipwreck, against loss of stock by disease, or of loss by storm; still more, when the man who lives by his industry has secured himself, not indeed against premature death, but against that which to such persons having families is the sharpest pang of premature death, the dread of leaving unprovided for those whose existence is bound up with his own, it is difficult to estimate by any tests of results that can be shown on paper the amount of good which is practically effected; for that gain must be measured, not by the number of persons actually rescued from distress, but by the infinitely greater number saved from the apprehension of distress—the fear being often as bad as the thing feared. It is not easy to overrate the benefit which the modern practice of insurance has conferred and will confer upon mankind. And why, in opening this Statistical Section, do I refer to it? Because it is a practice founded in its very nature on statistical inquiries, and which, without such inquiries, could never have existed."

'On the Municipal Expenditure of the Borough of Birmingham,' by Mr. T. AVERY.

'On the Vital Statistics of Birmingham,' by Mr. W. L. SARGANT.

Reports on Local Industries (First Group): 'Die Sinking,' by Mr. G. HEATON; 'Button Manufacture,' by Mr. J. P. TURNER.

'On the Division of Labour,' by Mr. W. B. ADAMS.

#### SECTION G.—MECHANICAL SCIENCE.

President—Sir W. G. ARMSTRONG.

Vice-Presidents—J. E. BATEMAN, Admiral Sir E. BELCHER, Capt. DAVID GALT, W. H. GARDNER, J. R. NAPIER, J. NASH, Prof. BANKING, C. VIGNOLE.

Secretaries—P. LE NEVE FOSTER, Prof. POLE, W. P. MARSHALL, W. MAY, H. LEA.

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#### THURSDAY.

The PRESIDENT (Sir W. G. Armstrong) opened the business of the Section by the delivery of an Address, in which, after advertizing to the papers on interesting and important subjects likely to come before the Section, he said with reference to Mr. Levick's coal-cutting machine that although it might be a matter of regret with some persons that the application of machinery to coal cutting and other similar purposes would operate to deprive labourers of their employment, it must be admitted that whatever tended to economize human labour in the dark and dangerous recesses of a coal-mine must be a benefit to the community; moreover, all experience had shown that although labour may be diverted in its channels by the introduction of machinery, the aggregate amount of employment suffered no diminution, but, on the contrary, seemed to increase. He regretted to observe that there was no paper coming before them on the progress which had been made in puddling by machinery: but he trusted that when another year had passed away, the President of this Section would have occasion to notice the attainment of complete success in that desirable object. He adverted to the growing importance of Bessemer steel, and its rapidly extending sphere of usefulness. The paper promised upon Mr. Siemens's regenerative furnace would bring forward a subject, the importance of which could scarcely be over-esti-

mated. Few people were aware of the prodigious waste of heat which takes place in all furnaces where it is requisite to communicate a high temperature to any material. If, for example, a mass of material is to be heated to a temperature of 3,000°, it is plain that the heating gases must, in the ordinary furnaces, escape at a temperature equal to that of the material, and thus carry off with them a heat which will, when the maximum temperature is attained, amount to two-thirds of the whole heat and combustion. The regenerative furnace arrests a large proportion of this fugitive heat, and adds it to the gaseous fuel which supports the combustion of the furnace. Wastefulness must always be deprecated in mechanical processes, but considering how much the greatness of this country is dependent upon her resources of mineral fuel, and with what prodigality we are now drawing upon these resources, any wholesale wastefulness demands especial reprobation, and renders the introduction of more economical methods of consumption a matter of national importance. The regenerative gas furnace not only prevents waste of fuel, but it also prevents smoke. Smoke may be altogether prevented, and is, in fact, inexcusable in the case of ordinary steam-boiler furnaces; but in his, Sir W. Armstrong's opinion, no means had yet been introduced by which its prevention could be effected in manufacturing furnaces heated directly by coal. If gas were substituted for coal, and the regenerative principle applied, the nuisance and disfigurement occasioned by smoke would be entirely avoided in nearly all manufacturing processes.

Sir W. G. ARMSTRONG then read a paper 'On Chain Proving.'

The paper consisted of a description of the principles involved in the apparatus for testing cables, recently established at Birkenhead by the Mersey Harbour Trustees, the construction of which was intrusted to the engineering firm of which Sir William is a member.

The hydraulic press, he said, had been for many years the appliance universally employed for exerting the teating strain, and nothing could be better fitted for the purpose; but the method for determining the amount of the strain had been extremely imperfect. Most commonly, the strain had been estimated by the indications of a mitre valve pressed down by a lever and weight. This mode of indication, Sir William said, was highly delusive; and he pointed out the advantage of substituting a packed, loaded plunger for the loaded valve. The packing, he said, should consist of cup leather, and the friction should vary directly as the pressure. When a chain broke in the test, it was desirable to show not only that it failed to bear the full test strain, but also what was the amount of strain exerted at the moment of fracture. Various indicators on the principle of those commonly used for steam-pressure had been used in the Birkenhead machine for this purpose, with unsatisfactory results. The pendulum indicator had since been brought into general use. In this indicator the pressure upon the indicating plunger was exhibited by the travel of a pendulum through a graduated arc. The movement was communicated from the plunger to the pendulum through the medium of a compound lever. When a chain broke the pendulum fell back until stopped by a ratchet, but left a marker at the exact point on the scale attained by the pendulum. Having spoken of the effect of friction on the results indicated, the paper proceeded to say that in the arrangement of a public chain-testing establishment, it was desirable that the apparatus for the various operations should be placed in such succession as would allow the chains to move from process to process without any retrogression. The paper then proceeded to a description of the Birkenhead establishment, in which the machines are adapted to cable lengths of fifteen fathoms, the Board of Trade having recently fixed upon that length as the limit of length of chain to be tested at one time. Sir William approved of this restriction as to length; and, having pointed out the objections to testing chains in greater lengths, he gave his opinion in favour of the action of the Board of Trade.

Mr. E. A. COPWER gave a description of 'A New Cotton Gin, for separating the Fibre from the Seed,' invented by him. The paper opened by

stating that, though undoubtedly the fibre could be taken off by the finger and thumb in the best possible manner (and no doubt was so taken off in olden times), that was a process so slow, that a man could do no more work than one pound weight of cotton per day. It then proceeded to describe the machines now in use, and the objections against them. The new gin introduced to notice by the paper acted on an entirely new principle, that of nipping fast hold of the cotton fibre close up to the seed, just as it might be taken fast hold of by a person's finger and thumb, and whilst the fibre was so held and protected, the seed was pushed away, so as to detach it from the fibre. Thus the fibre could not be broken, rubbed, or injured in any way, and was detached the full length to which it grew. The machine is composed of a roller having strips of leather on its surface at intervals, and strips of pointed surface between them; the roller revolves continuously, and a blunt steel blade is caused to approach the roller and recede from it at intervals, by means of eccentric, which also move it up and down, both in the direction of the surface of the roller, and in the opposite direction. In addition to this roller and blade, there is a vibrating beater to push off the seeds; this last action being very similar to the motion of the beater in a M'Arthy gin. The eccentric is on a small crank shaft, which moves the beater, and which has on it a pinion driven by a wheel on the roller shaft. This gin differs from all others in its complete intermittent action. He said the new machine did its work so effectually and quickly, that it got through several times as much work as a common M'Arthy gin, and many times as much as an "Indian churka," and at the same time did not injure the fibre as the saw-gin. It gave a decidedly increased length of staple from a given sample of cotton.

Mr. T. LEVICK described "Machinery for compressing Air, and the Applicability of such Compressed Air for working Coal-cutting and other Underground Machinery."—The advantages which the paper described were: 1. The simplicity of construction, and small cost. 2. The small amount of power to overcome the friction of the moving parts. 3. It was not affected by the production of heat in the compressed air. 4. It acted as a regulator, adapting its speed to the consumption of air underground. 5. Being used at the mouth of coal-pits, the additional loss of power was not of so much consequence. 6. The small amount of space occupied. The paper explained that the air compressed by the engine at the mouth of the pit was conveyed to the machinery underground in 4-inch cast-iron pipes, carried along the main-headings, from which the compressed air was conveyed in 1½-inch gas piping, connected with the machine in the pit by an india-rubber hose. The prominent feature of the machine is a pick, which digs the coal when the engine at the mouth of the pit is in motion. The pick can be worked at any angle at which the coal may lie, and can be easily put to work at any part of the thickness of the coal, whether it might be desired to "hole" in the bottom or at the top of the measure, or at a parting in the middle, or any other portion of it, by simply shifting the pick to a greater or less distance upon the axis on which it is keyed. The machine moves forward as the work progresses, by means of a hand wheel, which communicates motion by bevel wheels to the wheels upon which the machine travels. In cases of bad roof, the use of the coal-cutting machines had been objected to on account of the distance required (between the face of the work and the supports to the roof) for the back work of the pick. Another objection was that the work had to be passed over twice or three times in order to gain the required depth of cut. These objections had been obviated by the machines introduced to notice, by which the stroke of the pick, when making its cut, was from the back of the cut towards the face, instead of passing across the road and striking into the face in the direction observed heretofore. By this means the supports to the roof could be brought close up to the road; the concussion of the blow was reduced; and about six inches of the coal had not to be cut, it being forced out as the pick

approached the face. The quantity of compressed air consumed by each coal-cutter was determined from some indicator diagrams to be 327·6 cubic feet per minute, at 30 lb. pressure. The machine was working at 98 strokes per minute, showing an expenditure of air equal to 3 horse-power. The machines at Blaina Ironworks, South Wales, were working in coal which the men refused to work, and which, though opened out, has not been touched for years, and hole at the rate of 8 yards per hour, to a depth of 3 feet. The machine, when worked with the outward cut and self-propelling motion, will exceed this quantity considerably.

'On Torbite (a new preparation of peat) and its Uses,' by Mr. D. K. CLARK.—The object of the paper was to describe the system pursued at Horwich, near Bolton, for the manufacture of torbite and charcoal from peat. The obstacles hitherto to treating peat for the manufacture of fuel were shown to consist chiefly in the difficulty of separating, at a moderate cost, the excessive proportion of water held in suspension by peat in its natural condition, in consequence of the uncertainty of the climate and the great amount of hand-labour employed, and in the impossibility of efficiently condensing and solidifying peat by mechanical compression, which has been the agency relied on for that object. The author then explained that, according to the Horwich system of treatment, compression by mechanical force in any manner is studiously avoided; and that, on the contrary, advantage has been taken of the natural property of peat, suitably prepared, of contracting as it parts with its moisture, and becoming perfectly solid and cohesive. To separate the water, the peat travels upon endless bands, within a close chamber, exposed to currents of heated air, by which the moisture is effectually extracted; the blocks of peat being turned up on all sides in succession, so as to be equally and regularly dried, and emerging dry, hard, and dense. To the peat substance thus prepared the name of "torbite" has been given; and it was stated that it could be delivered at a cost of from 10s. to 12s. per ton. In the subsequent stage, the conversion of the torbite into charcoal, it was pointed out that the fatty and other matters disengaged during the charring process were valuable commercial products, the sale of which alone would nearly cover the cost of the whole process. Some experiments were described, proving the suitability of torbite and its preparations for purposes of generating steam and smelting iron ore, and in the other stages of the manufacture of iron. It was contended, therefore, that the problem of the probable utilization of peat had at last been solved. It was stated, in conclusion, that the bogs of Great Britain and Ireland cover an area exceeding five millions of acres, the average depth of which might be taken at twenty feet; and that the benefits of the utilization of peat on the large scale, particularly for Ireland, could scarcely be over-estimated from an industrial point of view.

Mr. R. W. THOMPSON read a paper describing a new rotary steam-engine, involving, it was said, an entirely new and ingenious application of mechanical principles for this purpose, and in which the difficulties arising out of the use of the steam stop or abutment are got rid of by dispensing with the steam stop entirely; and in which the inconvenience connected with keeping the packing steam-tight is obviated by giving the packing-straps the same curvature as the inside of the cylinder, causing them to bear equally and steadily against the steam, as in the packing of an ordinary piston. Mr. Thompson exhibited diagrams and wooden models of the engine. He said, from the experience he had in connexion with the new engine, he believed that for many purposes it would supersede the ordinary form of steam-engine, and in particular for gas exhausters. An engine on this principle was shown at work in the neighbourhood of the Section meeting-room.

#### FINE ARTS

##### SOUTH KENSINGTON MUSEUM.

AMONG the recent acquisitions to the South Kensington Museum are a vast number of articles

presented by the Rev. R. Brooke, of Selby. In addition to those previously named by us, as derived from the same source, the following may be mentioned as representing whole classes of objects: Medallions, miniatures, bead-work, ornaments for personal use in steel and gold, *bijouterie*, and suits of clothing—comprising court-suits, both for ladies and gentlemen, and portions of the same, including lace aprons, embroidery, brocade, mantillas, bodices, waistcoats, skirts, kerchiefs, trimming, epaulettes, sword-belts, swords, sabres, shoe-buckles, buttons, pins, necklaces, and a host of such things, mostly of eighteenth-century manufacture. The same gentleman has also given many gold and silver coins, principally of the last and preceding centuries, and of Portuguese, English, French and Irish minting, and, in addition, several books. Other purchases and gifts include a boat-shaped incense-holder of rock-crystal, probably Spanish, c. 1540.—A sweetmeat box, decorated with chasings in silver and attributed to J. Callot, c. 1620.—Plates of enamelled Rhodian or Persian ware, painted with roses, scrolls, &c.,—A portrait of Mrs. Everard, by Gainsborough, presented by W. Freeman, Esq.—A pax of gilt metal, with champlevé enamel, French, c. 1340.—A circular relique of the Saviour bearing the cross, gold, repoussé, German, c. 1370.—A boxwood box and cover, with a neck and knob of silver chased, the body carved with the events of the Passion, Venetian, 14th century (?).—A bottle of rock-crystal, oval, with scroll foliage cut in relief, Byzantine-Greek, eleventh or twelfth century.—Medicine-chest, covered with green satin embroidered with flowers in white satin and gold thread; the interior fittings consist of six phials of ruby glass, with silver-gilt tops, a two-handed cup, spoon, spatula, diminutive spoon and fork, all silver-gilt; French, first half of the seventeenth century, said to have belonged to Louis the Thirteenth.—A pair of lady's shoes, said to have belonged to Queen Charlotte.—A salt-cellar of "Henri-Deux ware,"—A tablet, oblong, painted in enamel on copper, the centre subject being our Lord, the twelve exterior compartments containing figures of the Apostles, ascribed to Jean Penicaud the Third, of Limoges.—Two orphreys of chasubles, embroidered with leaves, flowers, armorial and angels playing on musical instruments, Flemish, c. 1460.—Statuette, in silver-gilt, of the Virgin and Child, (c. 1350) on a pedestal supported by chimeras, German, sixteenth-century work.—Several pieces of majolica.—A wax model, in high relief, portrait of Rudolf the Second of Austria, by Wenceslaus Maller (?), 1606.—Altar painting, in tempera on panel, in seventeen compartments, with gilt Gothic mouldings, the subjects relating to St. George, from Valencia.—Bowl of Venetian glass, semi-opaque white, splashed with dark blue, seventeenth or eighteenth century.—Panel of stained glass, in the centre a quatrefoil containing a figure-subject, the ground diapered with the arms of St. Louis and his mother, from the Sainte Chapelle, Paris, early thirteenth century; this and three other panels were presented by H. Vaughan, Esq.—Eight Burmese books, presented by Lady Campbell.—Shield, circular, of wood, lacquered and etched in griaflature of gold on a dark ground, with a battle subject on the exterior, and figures on the interior surface, Italian, c. 1550.—Pavoise, or tournament shield, kite-shaped, stucco, painted and gilt on wood, blazoned, Florentine, c. 1450.—Casket, copper gilt and enamelled, diapered with armorial of England, Angoulême, Pembroke, Brittany, and Brabant, probably made for Aymer de Valence, Earl of Pembroke, c. 1290.—Conical cap, of coarse brown felt, said to have been worn by O'More, an Irish chief, c. 1500.—Bookbindings, Grolier, Flemish, French, and Italian styles, fifteenth and sixteenth centuries.—Wooden statuette of an emaciated old woman seated on a stool, carved in arabesque, German, early sixteenth century. The last item and the following articles were purchased at the Poutrelles sale: Crucifix, in the style of Alonso Cano.—Statuette in bronze, a dwarf blowing a trumpet, Italian, sixteenth or seventeenth century.—Knocker, Italian bronze, formed by two half figures of youths terminating in foliage, surmounted by a mask, Italian, six-

teenth century,—Rilievo, bronze, Italian, fifteenth century, Vulcan repairing the wings of Cupid, and Cupid instructed by Mercury,—A chiselled iron purse-frame, Italian, sixteenth century,—Jug, dish, and plate, by B. Palissy,—Tazza and cover, by P. Raimond, Limoges enamel, in grisaille, the interior painted with a classic subject, apparently the Centaurs and Lapitha, the cover with medallions, trophies, and armoria, dated 1544.—Two panels of stained glass, angels holding shields of arms, Swiss, c. 1490.

## MUSIC AND THE DRAMA

## THE DRAMA IN PARIS.

Paris, September, 1865.

THE theatrical season has just commenced in Paris. The Théâtre Lyrique has re-opened with the 'Flûte Enchantée,' and not with Litoff's new work, as reported; the former was a great success, of which the cream was scarcely skimmed when the doors of M. Carvalho's temple were closed for the dog-days, and there is no doubt that it will run a long time, if necessary, with the singing of Madame Carvalho and Mlle. Nilsson.

The 'Africaine' has reached its fiftieth night, and is said to have brought nearly six hundred thousand francs to the treasury, and yet it cannot be said that the work has achieved a grand success. It is remarked that its presentation has not once been interrupted by indisposition or accident, and that not one of the leading artists has been replaced on a single occasion.

The Opéra Comique is rehearsing a new work by Victor Massé, 'Fior d'Alizia,' the libretto by Michel Carré, of which report speaks enthusiastically.

The Bouffes has been cleaned and touched up, so as to present the most enticing aspect. Offenbach assumes the reins again, and some of the old favourites, who had been dispersed, rally round him. The opening programme is composed of Grisar's 'Deux Innocents,' the 'Boîte aux Surprises' of Deffes, and Offenbach's 'Chatte métamorphosée en Femme.' Offenbach is hard at work on a new work of importance, to be called 'Les Bergers.'

Lastly, in the musical way, the Porte St.-Martin is preparing the 'Bourgeois Gentilhomme,' with music by the last-named happy and prolific composer; Madame Ugaldé leaves the Lyrique to figure in this new Molière—Offenbach.

M. Ponsard's promised new play is to be produced at the Théâtre Français, about the middle of the present month, that is to say, when the stars of the establishment have returned home, glittering more brightly than ever with the lustre gathered abroad. The harvest of lous, florins, and roubles, as well as of laurels, is nearly over; and M. Ponsard is to furnish the matter for the harvest home. In the mean time, Peron's curious old play 'La Métromanie' has been resuscitated.

The Odéon keeps its doors closed rather longer than usual this season, in order to complete the réparations and decorations which will give the second Théâtre Français quite a grand air; the re-opening is announced to take place in a few days.

The Gymnase, which is now in the full tide of success, has commenced the season with two novelties, a three-act play, by M. Henri Meilhac, author of the 'Autographe,' 'Vertu de Célimène,' and 'Les Curieuses,' entitled 'Fabienne,' and a lively farce, 'Five Hundred Francs Reward,' by MM. Siraudin and Bernard. 'Fabienne' belongs to a class of plays in which the Parisian theatres abound; it furnishes another version of the old story of rivalry between mother and daughter, and the sacrifice of the former, but M. Meilhac has treated it charmingly, although there is a slight excess of sentimentality here and there, and a few incongruities. The author also departs in a great measure from the traditions of French sentimental comedy by the introduction of an amusing underplot, and his work gains greatly thereby in naturalness. 'Fabienne' is a scene from the comedy of life, with natural accompaniments, and not a mere sentimental poem in action. It is essentially a ladies' play, and the Gymnase is

now strong in actresses; there are seven female characters in the piece, and all are well filled. A peculiar interest attaches to one of the ladies in question; she has stepped from private life on to the stage of the Gymnase without any previous apprenticeship, and has at once secured her position as an actress of great refinement and considerable power,—a triumph not often achieved.

The Vaudeville has engaged Mr. Charles Mathews, who has appeared in 'L'Homme Blasé' ('Used up'). Mr. Mathews has made a decided hit; his success was unequivocal. Y.

## MUSICAL AND DRAMATIC GOSSIP.

On Saturday, the Haymarket Theatre closed; but Mr. Martin Tupper's tragedy of 'Alfred' was not performed on the occasion. The trial could not have been fairly made after the failure of 'Fra Angelo,' the full declaration of which had been enforced; as on Thursday and Friday other pieces were substituted. 'The Lady of Lyons' was played on Saturday, with Miss Katherine Rodgers as Pauline. Mr. Montgomery addressed the audience, and congratulated himself on having succeeded, on the whole, in his adventure. He has certainly carried it through with spirit, if not with judgment.

One out on a holiday writes thus:—"Having by innocent and hearty commendation printed in the *Athenæum* some years ago, been an accessory (I have been again and again told) in spoiling the prettiest, most picturesque and peculiar southern summer retreat I have yet seen (and such was Arcachon before it was pounced on by tourists, vulgarized by speculators and its beauty destroyed), I will not date my present note beyond giving it the long range of North Germany, nor lend myself to sophisticating another quiet, primitive little place of waters, of its kind no less charming, a place where fresh streams run in the highways, where the richly-wooded hills are broken by the greenest of green meadows, reaching up in airy vistas to a first distance of bold, wooded heights, with a mountain range behind them, some crowned by ruins, which belong to the grand romantic history of old Germany. I know nothing more simply picturesque than the open space serving as place of meeting or public walk, where half-a-dozen booths (one containing as excellent a little brass band as I wish to hear) nestle under a rock beside a green shaded with fine oaks, watered by a freakish rivulet hurrying among grey stones and gushing up into a fountain jet, which would be a sight in one of our public gardens. No end of delightful walks and excursions near and far. In the evening the air is alive with the click of the wood-cutters' carts as they slip down from the forests on the hills, and the tinkling chime of bells as the herd comes home. From such a resting-place I write. But my reserve as to locality, price of lodgment, access, excursions, &c., need not prevent my speaking in this particular column of an event and an experience that remind me once again how music of one kind or other is sure to be found everywhere by him who has ears. To-day it took the form of a passing band of Black Brunswickers, fifty strong or thereabouts. I never saw anything prettier than the group made by them in the hospitable garden of one of the few rich residents, where they played under the flickering shadows of rich trees tempering the keen sunshine,—unless it was the camp-dinner of the entire battalion in the open air, on a piece of high, broken ground, profusely watered by quick streams, backed by hills clad with firs, and shaded by oaks, the leafage of which shone bright as emeralds in the glow of the September afternoon. The gloom of the funereal colour of the Brunswick uniform was not felt here. As to the band, appraised without reference to its framework, a neater, cleaner-limbed, more civil set of harmony-musicians could not have been assembled. I never, save many years ago at Salzburg, heard anything of its kind more admirable, never heard the swing of the Vienna waltz time better given (though the dance in itself reminded one that the golden age of Lanner and Strauss and Labitsky has passed), never heard richer tone, heartier spirit, nor truer expression. But here, in the core of the heart of Germany, was it not curious also to hear the delicious airs of M. Gounod's 'Faust'

played with such enjoyment and understanding as to do full justice to every charm which they possess. Never was there music already worn so threadbare which tires so little as this. I caught myself listening as eagerly as if I did not know every note of the best of modern operas by heart."

"A postscript may give a slight illustration of the reality of that German honour for great artists, which has again and again been so contemptuously thrown into our English teeth as something we do not possess in our money-loving country. Passing a night in Brunswick, I spoke with mine host, not a stupid or illiterate man, of the memorable festival there at which Mendelssohn conducted his 'St. Paul,' and was crowned in the theatre. Yes, my friend recollects it perfectly well, having been present as a boy. 'What a pity,' he went on, 'that he died in Paris last year!'—'Died in Paris?' said I, distanced for the moment. 'Ah, yes! when he went to set forth the 'Africaine'—That was not Mendelssohn, but Meyerbeer,' said I.—'What?' said he, 'Well, I did not know.'"

To the list of the operas performed in North Germany during the last days of August and the first of September, may be added, 'William Tell,' at Berlin, with Herr Wachtel as 'star'; 'Der Freischütz,' at Hanover, with Herr Niemann for hero. At Brunswick, Mozart's 'Figaro' and Lortzing's 'Der Wildschütz,' and at Bremen, the inevitable 'Martha' have been given. There is no startling novelty in the above, it will be owned. The venturesome folk, however, who desire to make further acquaintance with the difficulties and discords of musical futurity may be consoled by hearing that the pianoforte score of Herr Wagner's 'Die Walküre' is published. Fräulein Bettelheim, whom we Londoners know as a singer after the German fashion, with low voice (a lady clever as a pianist as a singer), is to take the ungrateful part of Selika in 'L'Africaine,' at Vienna. Fräulein Orgeni, who for some time studied under Madame Viardot, has been engaged at Berlin, where Fräulein von Edelsberg is to replace Fräulein D'Ahna.

There is talk of a monument to Conradin Kreutzer, to be erected at Riga, if sufficient funds can be found to commemorate the composer of the 'Nachtlager,' and the part-songs which are among the most popular ones in every German collection.

On foreign authority we may mention that Mr. Tom Höhler, the tenor for whom many of our fashionable amateurs have been of late predicting a great future, has been singing, with great success, in a concert at Aix-la-Chapelle.

## MISCELLANEA

*The Royal Artillery.*—In justice to the officers of the Royal Artillery, I beg to inform you I am not "Lieut. Browne," as stated in your recent article on 'England's Artillerymen.' I was enlisted into the Band of the Royal Artillery in 1848 (being then ten years of age), and I have remained in that department of the regiment ever since. An article on the 'North-West Passage' appeared in the *Athenæum* of October 20, 1860, wherein I am mentioned as a private, which I really was at that time. I also take the opportunity of saying, in answer to your critic's objection respecting the East India Company's Artillery, that my work only professes to treat of the Royal Artillery to the date of their amalgamation with the Bengal, Madras, and Bombay Artilleries. I cannot expect you to publish this letter, but I should feel obliged if, out of respect for the well-known abilities of the officers of the Royal Artillery, you would be kind enough to inform your readers that the author of 'England's Artillerymen' is only a sergeant, and not a lieutenant, as stated in the *Athenæum* of August 12.

JAMES A. BROWNE, Sergeant, R.A. Band.

TO CORRESPONDENTS.—H. K.—J. H.—S. A.—S. P. D.—B. S.—F. W. B.—received.

*Errata.*—P. 283, for "Schenfelein" read Scheuflein; p. 349, col. 3, line 13, for "Burphair" read Burgair; p. 350, col. 2, line 33, for "Gayler" read Galer; p. 351, col. 1, line 18 from bottom, for "The Turkey shall coom, and new Gerasalem," read "The Turkey-shell coom and new Gerasalem"; col. 2, line 24, for "Les Porcherons" read Les Porcherons.

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